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„Frog, where are you?” – Narrative competence and the aspect of reference in children with Asperger’s syndrome

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*SEIN Blick ist vom Vorübergehn der Stäbe
so müd geworden, daß er nichts mehr hält.
Ihm ist, also ob es tausend Stäbe gäbe
und hinter tausend Stäben keine Welt.*

*Der weiche Gang geschmeidig starker Schritte,
der sich im allerkleinsten Kreise dreht,
ist wie ein Tanz von Kraft um eine Mitte,
in der betäubt ein großer Wille steht.*

*Nur manchmal schiebt der Vorhang der Pupille
sich lautlos auf -. Dann geht ein Bild hinein,
geht durch der Glieder angespannte Stille –
und hört im Herzen auf zu sein.*

Rainer Maria Rilke (1902)

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Abstract

In the last few years, scientific research has agreed on the fact that the disorder of autism is characterised by a significant delay in language. In contrast to infantile autism, this feature does not seem to apply to individuals with Asperger's syndrome. Furthermore, it is of particular interest, as to whether cognitive deficits or impairments in other areas may be responsible for this delay in language.

With regard to language development, the current version of the international classification system, which is mostly used in the German-speaking world, suggests that people with Asperger's syndrome do not follow any deviant pattern in their development of language. Affected individuals are further supposed to show an incredibly rich and creative wealth of expression. As regards narrative abilities in children with Asperger's syndrome, only a few studies have been published. Indeed, these individuals demonstrate a promising target group as their linguistic abilities do not seem to be that impaired when compared to individuals with autism.

At first, this diploma thesis will focus on the historical research background, symptoms and aetiology of autism. Furthermore, it will describe the development of language as well as the existence of narrative abilities in children with Asperger's syndrome. By comparing two case studies, the aspect of reference as well as the ability to create a coherent narration shall be discussed.

Zusammenfassung

In den letzten Jahren haben zahlreiche Untersuchungen postuliert, dass die verzögerte Sprachentwicklung ein wesentliches Merkmal des Autismus sei. Im Gegensatz zum frühkindlichen Autismus scheint diese jedoch nicht charakteristisch für Personen mit Asperger-Syndrom zu sein. Des Weiteren stellte man sich die Frage, ob diese Verzögerung auf allgemeine kognitive Defizite, oder auch auf andere Faktoren zurückzuführen sei.

In Bezug auf die sprachliche Entwicklung geht das aktuelle, für den deutschsprachigen Raum spezifische Klassifikationssystem ICD-10 davon aus, dass die sprachlichen Fähigkeiten bei Menschen mit Asperger-Syndrom kaum bis gar nicht beeinträchtigt sind. Vielmehr scheinen diese über ein äußerst kreatives und sprachlich reiches Repertoire zu verfügen. Im Hinblick auf die Entwicklung der narrativen Fähigkeiten, wurden bis dato erst wenige Untersuchungen durchgeführt, obwohl sich Kinder mit Asperger-Syndrom aufgrund ihrer weniger beeinträchtigten Sprach hervorragend dafür eignen würden.

Diese Diplomarbeit wird neben einer Einführung in Geschichte, Symptomatik und Ätiologie des Autismus die Thematik der sprachlichen Entwicklung sowie das Vorhandensein narrativer Fähigkeiten bei Kindern mit Asperger-Syndrom theoretisch erörtern. Des Weiteren soll anhand eines Vergleichs zweier Studien diskutiert werden, ob diese Kinder dazu in der Lage sind, kohärente Erzählungen zu produzieren.

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1. Introduction

Autism can be viewed as one of the most fascinating phenomena with respect to social and behavioural disorders in child- and adulthood. Indeed, affected individuals seem to develop in a typical manner before certain ‘features’ appear. Although research has made an effort to identify the causes and symptomatological characteristics of the disorder, there are questions that remain unanswered. Thus, current science is still attempting to comprehend the nature and puzzle of autism per se.

1.1. Motivation

During a lecture at my university in Vienna the topic of autism was intensely debated. The professor did not just focus on typical characteristics and diagnosis, but also on the manner in which autistic individuals perceive the world and their social environment. Intrigued by the fact that the spectrum of autism is so wide-ranging, I was very enthused to discover more about this condition and decided to deepen my knowledge in this area.

During my research, I focused particularly on individuals with Asperger’s syndrome as I was especially interested by Asperger’s descriptions in his work “‘Autistic psychopathy’ in childhood”. Indeed, people with Asperger’s syndrome possess some extraordinary talents, known as “islets of ability”, and are also often gifted with an incredibly creative use of language. This makes it fascinating to investigate not just language development in general, but also specific linguistic areas in autism.

During my academic studies, I concentrated specifically on the fields of Psycho-, Patho- and Neurolinguistics, which endowed me with extra knowledge about the broad field of language development. With the help of my advisor, I also had the possibility to participate in specific lectures about child language development, which eventually led me to the main theme of my thesis.

Within this diploma thesis, I will attempt to impart a basic knowledge about the broad topic of autism and furthermore, give a general introduction to the absorbing field of individuals with Asperger’s syndrome. Not only the historical background of autistic research and descriptions of the behaviour and symptoms, but also the development of language and narrative competence in children with autism and Asperger’s syndrome shall be of particular interest. In addition to this, I will mention the development of language in typically developing

children as it can be very useful when analysing the language of atypically developing individuals. Indeed, the acquisition of narrative understanding challenges the typically developing child in different manners. Certain abilities must be mastered in order to produce a coherent narration. Thus, it is of particular interest to discover whether children with autism and Asperger's syndrome have also acquired this competence.

To this day, various research disciplines have attempted to solve the "mystery" over autism spectrum disorders. Although much progress has been made, there are still questions that need to be answered. In fact, it is quite difficult to make a clear distinction between the conditions of autism and Asperger's syndrome as they are found on the same spectrum and have a lot of features in common. Therefore, I will focus not only on individuals with Asperger's syndrome, but also on associating these individuals with autistic people.

This diploma thesis is dedicated to everyone who is fascinated by the field of autism research and to all the individuals who perceive the world "*as living in a glass bubble*". Without them it would not have been possible to be where we are.

1.2. Research question

This diploma thesis will introduce the topic of autism spectrum disorders, specifically language development and narrative competence in individuals with Asperger's syndrome, based on biographical research. Furthermore it will aim to answer the following questions:

- **"Do individuals with Asperger's syndrome differ significantly from people with autism with respect to their language development?"**
- **"Do children with Asperger's syndrome possess narrative competence when compared to children with autism and typically developing children?"**

1.3. Thesis structure

This thesis will analyse the subject of narrative competence and structures of children with Asperger's syndrome. The key aspect of it will concentrate on reference; moreover, it will examine which strategies are used to create a coherent text. Autism as a topic is a very broad and cannot be explored sufficiently within this thesis; hence the central theme will concentrate on Asperger's syndrome.

Firstly, it will discuss the history of autism and Asperger's syndrome, introducing the leading pioneers, not solely in the field of linguistics, but also in other scientific disciplines. In the following chapter, it will try to make a distinction between the characteristics of autism and other disorders (e.g. Schizophrenia, Rett's disorder). Furthermore, diagnostic assessment of autistic spectrum disorders as well as epidemiological data shall be introduced. In chapter 4, the different classification systems, specifically the classification system ICD 10 will be discussed. Moreover, it will proceed to give a general view of the common symptoms and the cognitive profile in autism. In the next chapter, the thesis will consider the significance of the principal theories of the aetiology. Chapter 6 goes on to consider language development in autism and Asperger's syndrome and will further describe language acquisition in typically developing children. The next chapter will describe Asperger's syndrome, in its entirety, in addition to typical characteristics of language and social behaviour connected with it. The importance of acquisition of narrative and discourse abilities in typically developing children and individuals with autism and Asperger's syndrome will then be looked at. Ultimately, narrative competence and the aspect of reference in Asperger's syndrome shall be discussed. Unfortunately, I did not have the possibility to carry out my own personal case study. Therefore, two case studies will be compared in order to discuss the questions listed above.

As mentioned previously, I should like to point out that this diploma thesis is based on bibliographical research in relation to my research question. Therefore, it cannot be assumed that it presents an entire work of reference. Nonetheless, I have tried to refer to specific literature for a more detailed discussion. Furthermore, I would like to mention that there exist different spellings for the term "Asperger's syndrome". Throughout my thesis, I will use this spelling as it has thus far appeared.

2. A brief history of autism

2.1. Introduction

Whenever we hear the term autism, it calls to mind a number of theories and researchers, including the Viennese paediatrician Hans Asperger. Alongside the Austro-American psychiatrist Leo Kanner, Asperger is viewed as one of the pioneers in the field and history of autistic research. Both of them published their work in the mid-1940s, Kanner in Baltimore, Asperger in Vienna (cf. van Krevelen 1971:82).

This fact leads to the impression that the idea of autism is a relatively recent discovery, although it is actually a very old one. Researchers tried to solve the “mystery” about autism for decades, but there are still areas and questions that seem to be undiscovered. What is autism? What causes autistic disorders? What are the typical characteristics of autism?

Already three centuries ago, some cases of children who showed a kind of “strange” behaviour, were reported. Even though we do not have any official documents or case reports, these descriptions can be seen as an important step towards the attempt to comprehend the broad topic of autism.

2.2. The wild boy of Aveyron

In 1799, Joseph Haslam documented the case of a five-year old boy who demonstrated a characteristic trait, which in contemporary literature about autism is known as “*autistic aloneness*” (Frith 2003:6). Haslam did not carry out a full medical diagnosis, but he postulated a few characteristics, which he observed (cf. Papadimitriou 1997:5).

Around the same time, the French doctor, Marc-Gaspard Itard (1799) presented the case of a wild boy who became known as “Victor of Aveyron”, found out in the woods of central France. He was perhaps twelve years old, but he neither spoke nor reacted to questions or noises next to him. All in all, his whole persona seemed in a way uncivilized (c.f. Papadimitriou 1997:5). Hence, he was perceived as “[...] *truly savage and bereft of all moral sensibility.*” (Frith 2003:35).

A lot of people tried to examine the behaviour of Victor and to understand his habits. Some believed that his behaviour would change once introduced into society; others simply

postulated theories (including brain pathology, social incompetence etc.) in order to explain a reason for his strange habits. One explanation was that Victor was abandoned by his parents, because they could not bear his “abnormality” anymore. Some believed that this explanation was too simplistic, therefore they tried to formulate alternative theories. They wanted to answer, how a child, according to them mentally retarded, could survive completely alone out in the woods. There arose the idea as well that Victor had been a “normal” child, and through a strange twist of fate, was lost when he still was very young. He showed deficits in social behaviour and language, which could be explained due to the lack of opportunity (cf. Frith 2003:35 ff.).

However, how should he ever have acquired language by living outside of human society?

Itard took the boy in and tried to educate him. In fact, Victor was never able to speak a single word, but he could observe a kind of change in his social behaviour. The first scientific paper about the case of Victor was written by Harlan Lane in 1976. Lane was not convinced by the fact that Victor suffered from a condition similar to autism and in his papers he discusses that topic within three main questions (cf. Frith 2003:37 ff.).

Even Phillipe Pinel, one of the most famous physicians of that time, after examining the body of Victor, was convinced about the fact that the boys’ behaviour could not be socialised. Therefore, it is all the more impressive that the education of Itard led to dramatic improvements in the life of Victor, but there were certain characteristics, concerning social values, that the boy could not handle. However, Itard stated in his final description that the social behaviour of Victor and his education in general were still incomplete (cf. Frith 2003:40 ff.).

Nevertheless, the question remains, how a twelve year old boy could handle a life isolated out in the woods. Despite examinations by many researchers throughout history, the solution remains controversial, but the study of the “wild boy of Aveyron” was an extremely important step in the understanding of autistic behaviour.

2.2.1. The case of Kaspar Hauser

In 1828, when a savage-looking boy appeared on the Unschlittplatz in Nuremberg, it caused a sensation. He could neither write nor spell his name and except for a few single words, he was only capable of saying a single phrase. Furthermore, the boy was capable of writing his name and when he appeared he was carrying a letter, written by someone else. Like observed in the

case of Victor of Aveyron, Kaspar Hauser showed some features, concerning his social behaviour, which implied he had never had contact with the outside world. In fact, he became a sensation in the small city of Nuremberg, although he was assassinated in 1833, leaving questions as to his origin. It was assumed that he originated from royal blood, but until today there is no proof of that (cf. Frith 2003: 43 ff.).

We cannot say for sure that Kaspar Hauser suffered from autism, but the fact is that he showed deficits in areas, which we can still observe in the actual autistic symptomatology.

2.3. Definition

The term autism derives from the Greek word *αὐτός* which means “self“. Although the symptoms have been characterized in the last decades, the disorder of autism cannot be seen as a modern phenomena (cf. Frith 2003:5).

Actually, the terminology can be ascribed to the Swiss psychiatrist Eugen Bleuler, who introduced it in 1911. In fact, he used the term to describe the symptom of schizophrenia and noticed schizophrenic persons as incapable of establishing social relationships to other people (cf. Bleuler 1911:304).

As far as we know, schizophrenics tend to withdraw from previous social relationships, which is the big difference to autistic people who do not actively avoid contact with other people. Therefore, the term originally developed by Bleuler does not describe the behaviour of autistic individuals (cf. Remschmidt 2008:9).

By adopting that term, the Austrian psychiatrist Leo Kanner (1943) described the behaviour of autistic children and the disorder per se. He was born in 1896 in Klekotow and studied medicine in Berlin where he finished his dissertation in 1919. In 1924 he settled down in America, where he formed the foundation of child and adolescence psychiatry at Johns-Hopkins hospital in Baltimore. His first publication “Autistic disturbances of affective contact”, which he published in 1943, was one of the pioneer works in the field of autistic research. Within his work, Kanner compared the differences and similarities of eleven children who showed some kind of strange behaviour. Leo Kanner died in 1981 in Syskeville/Maryland at the age of 86 (cf. Remschmidt 2008:12).

In 1944 the Austrian pediatrician Hans Asperger published his dissertation with the title “‘Autistic psychopathy’ in childhood” in which he described the syndrome named after him. Within this work, he became one of the pioneers in the field of autistic research and gained

attention in child and adult psychiatry as well. Thanks to Lorna Wing, the syndrome was perceived as a named syndrome in 1981. Surprisingly, Kanner and Asperger published their work independently from each other and even in the beginning they were unaware of each other's work (c.f. Lyons and Fitzgerald 2007:22). Nonetheless, both of them postulated that autism is a disturbance that seems to be present from birth (cf. Remschmidt 2008:14).

All in all, both authorities established certain characteristics in order to diagnose the disorder of autism, but there is still current debate as to how the two syndromes differ from one another. Some have argued, if there exist certain overlaps between them or if each disorder is represented by its own features. Nevertheless, we can at least state one common feature in both descriptions, namely, a complete social isolation from the outside world (cf. van Krevelen 1971:82 ff.).

Throughout history, there have always been isolated cases of strange and savage children. Some of them were suckled by wolves and wild animals and as far as we know, these events are not just part of mythology (cf. Gillberg and Coleman 1992:1).

Due to the fact that we concentrate on people who show certain unusual characteristics in their behaviour, they automatically become a target for fantasies and myths. In particular, we can observe that kind of behaviour in impaired children, especially in children with autism. These children show in fact some specific characteristics and patterns in their daily habits. It shall be mentioned that the diagnosis of the autistic syndromes, as well as the characteristics per se, are characterized by a broad spectrum (for further discussion see Chapter 3). Therefore, one of the major problems is to find appropriate diagnostic criteria that can be used for all kinds of autistic disorders. From that we can conclude that the disorder per se is a very broad one and that every autistic person shows individual characteristics in its behaviour.

2.4. The Beginnings

As mentioned before, the autistic syndromes and their description differ in various ways. Concerning Kanner's description, Lorna Wing (1980) referred to it as "*childhood autism*", but we can still find other expressions, like "*autistic disorder*" (American Psychiatric Association (APA) 1987) or "*pervasive developmental disorder*" (World Health Organization (WHO) 1990) (Wing 1980, APA 1987, WHO 1990; cited by Gillberg and Coleman 1992:18).

Even if there exists a broad range of expressions, the concept of infantile autism is the one which is used most today to describe classic autism. About the same time, the term

“childhood psychosis” was introduced and applied as a diagnostic term by Fish and Ritvo (1979) (Fish and Ritvo 1979; cited by Gillberg and Coleman 1992:18)

It was in 1978, when the child psychiatrist Michael Rutter distinguished the concept of autism from other psychiatric and developmental disorders such as schizophrenia, specific language impairment etc. From that moment on, the autistic symptomatology underwent an important change (cf. Baron-Cohen 2008:15 ff.).

In the late 1970s, the “Journal of Autism and Childhood Schizophrenia” changed its name to “Journal of Autism and Developmental Disorders”. Actually, this event coincided a decisive split between autism and schizophrenia and even in the current classification systems we cannot find this combination anymore. Instead they all refer to “pervasive developmental disorders”. As we can notice, autistic terminology is problematic and even today we cannot achieve agreement about it. Some became concerned that the originally defined concept of Kanner was stretched too far and therefore the term “autistic syndrome” could involve too many different disorders, concerning social relatedness. Hence, this would make an appropriate distinction between them (cf. Gillberg and Coleman 1992:18).

In the 1960s the Austro-American psychoanalyst Bruno Bettelheim blamed on unbalanced maternal relationship as a cause for autism. As a result, the so called “parentectomy”, which means a departure from the parental environment, was introduced. The aim was to re-socialize children by giving them to foster parents. Soon it was realized that this kind of “treatment” did not have an effect in the child’s social development and parents were not any longer blamed for their child’s unusual behavior (cf. Baron-Cohen 2008:19).

It was even mentioned in 1983 by Niko Tinbergen that some kind of emotional trauma could cause autism, but like in the case of Bettelheim, there was no evidence for it. In the following years, thanks to Bettelheim and Rutter, these theories about the causes of autism (for further discussion see Chapter 6) were rejected and research came to the conclusion that autism is a neurological condition (cf. Baron-Cohen 2008:19 ff.).

Besides Kanner and Asperger there exist an immeasurable number of theories, concerning the matter of autistic research. Therefore I will concentrate in the following chapters on the most important ones.

3. The Autistic Spectrum

3.1. Introduction

During the last fifty years, classic autism was seen as a rare disorder and affected children were noticed as different. In 1981, Dr. Lorna Wing, the founder of the National Autistic Society (NAS), suggested that the disorder of autism was a spectrum condition. Accordingly, it cannot be seen as categorical and must be divided into several types which all lay on one spectrum (cf. Baron-Cohen 2008:21).

Since the last decade, a significant number of individuals have been observed who suffer from impairments in communication, socialization and imagination. To examine these deficits, Wing and Gould (1979:13) introduced the expression “*triad of impairments*”, which in recent times describes the main characteristic features of a group of disorders called autistic spectrum disorders (ASDs) or pervasive developmental disorders (PDDs).

Whereas both terms are used in the clinical literature, British literature prefers the aforementioned one (cf. Cummings 2008:182).

As mentioned previously, autistic individuals show a huge variation in their characteristics and their behaviour. Therefore, the expression “spectrum” is more appropriate to describe the symptom and its whole variation and mintage. In comparison, Simon Baron-Cohen (2008) prefers the expression “*autistic spectrum condition*”. According to him, the term condition is more accurate, because it does not necessarily imply a disability (Baron-Cohen 2008:14).

The Diagnostic and Statistical Manual DSM-IV-TR (American Psychiatric Association 2000) defines five autistic spectrum disorders:

“Autistic disorder, Rett’s disorder, childhood disintegrative disorder, Asperger’s disorder and pervasive developmental disorder, not otherwise specified (PDD, NOS)”

(APA 2000; cited by Cummings 2008:183).

In contrast to the APA (2000), Baron-Cohen (2008) described six groups:

Asperger’s syndrome, high-functioning autism, medium-functioning autism, low-functioning autism, atypical autism and pervasive developmental disorder (not otherwise specified)”.

(Baron-Cohen 2008:14).

The most prominent and researched forms of the autistic spectrum are Asperger’s syndrome and autistic disorder, which is also sometimes known as “classic autism” or “infantile autism”. Whilst the DSM-IV lines out certain criteria for making a particular diagnosis, the validity of Asperger’s syndrome as a single diagnostic category remains controversial still.

One of these issues, which is most discussed, concerns its similarity to high-functioning autism (HFA) (cf. Cummings 2008:183 ff.)

For that reason, the autistic spectrum was expanded quickly and more subgroups were added. Hence, the whole attitude about autism changed in a positive way. It was recognized that autism demonstrates a lot of facets and therefore we can include more cases. Professionals are informed about the autistic spectrum and are able to accomplish their therapy in a more effective way. Above all, there was made a clear separation between children and adults with different forms of autism spectrum disorder. Even though there exist a broad terminology, recent research agrees with the concept of autism as a spectrum disorder and does not describe it as a single symptom, which is the most important step forward (cf. Baron-Cohen 2008:25).

3.2. The Autism Spectrum Quotient – Measuring the spectrum

Nowadays, the measurement of an autistic spectrum is no longer controlled by any assessment of typical behaviour. Using the “Autism Spectrum Quotient (AQ)” as a screening instrument allows us to see a normal distribution of autistic traits not only in individuals who suffer from autism, but also in the general population. It is a form of a questionnaire that can be applied from the age of four years through adulthood and establishes how many autistic traits an individual shows. There exist different versions for children and adults, either applied by a parent or completed by a self-report.

In total, there are fifty items to be completed and each of them is answered, either “Agree” or “Disagree”. Hence, for every appropriate answer the respondent receives a point. Accordingly, each respondent will receive an AQ between 0 and 50. When applied to a large population, it creates a kind of normal distribution¹, which we can compare for example with the measurement of the IQ. This demonstrates not only an average, but also a small percentage, which display an extreme. That means that we can find the appearance of autistic traits normally distributed across the population (cf. Baron-Cohen 2008:30 ff.).

¹ “A normal distribution is the bell curve that describes many traits or characteristics in which variability is seen across a population” (Baron-Cohen 2008:30).

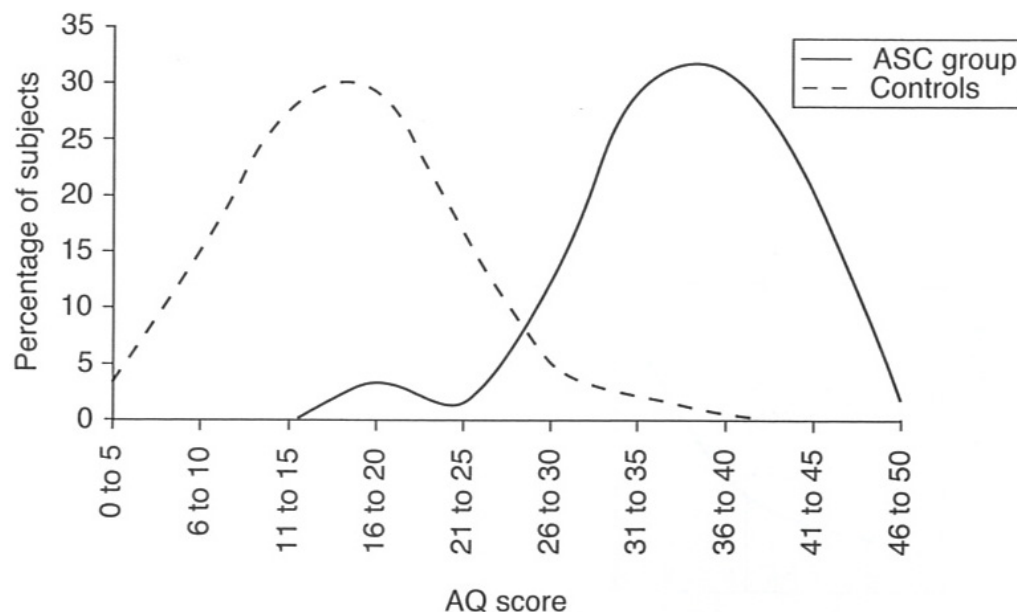


Figure I AQ scores in a group diagnosed with Autism Spectrum Conditions (ASC), and a typical control group (Baron-Cohen 2008:32).

In Figure I, the AQ score goes from zero to 50. As can be stated, we can find the occurrence of autistic traits in the controls (people without a diagnosis) along the dotted line in the range 0-25. If we assume that scores between 16 and 23 are average, Figure I shows that people with an autistic spectrum diagnosis fall in the range of 26-50. This leads us to the conclusion that 93 per cent of the general population display an average, while 99 per cent of the autistic population present the extreme of the scale. We can also observe an overlap between both of them. This means that there must exist some autistic people who fall in the average range, whilst there are people who have never been diagnosed who fall within an extreme range. Therefore, we have to keep in mind that the AQ is a screening instrument, which does not give a diagnosis. For giving an appropriate diagnosis, there has to be evidence that the person is suffering to some extent (e.g. depression, anxiety).

This reminds us of the different occurrence of autistic traits in suffering individuals as well. We could compare two individuals who have the same AQ score, but one of them might need a diagnosis while the other might not (cf. Baron-Cohen 2008:32 ff.).

3.3. Autism Spectrum Disorders

3.3.1. Autistic Disorder

Autistic Disorder (AD), which is also known as “Kanner’s syndrome”, “infantile autism”, or “classic autism”, was first identified by Leo Kanner in 1943 (cf. Kanner 1943). Amongst all spectrum disorders, this form is the most researched and one of the most severe impairments of childhood and later life. The DSM-IV-TR (2000) stresses the fact, that at least six of 12 characteristic features must be present in an individual to make an appropriate diagnosis. These characteristics include

“qualitative impairments in social interaction, qualitative impairments in communication and restricted, repetitive and stereotyped patterns of behaviour, interests and activities.”

(APA 2000; cited by Cummings 2008:183).

Furthermore, an onset before the age of three years must be present (cf. Cummings 2008:183).

According to DSM III-R (APA 1987), at least eight criteria must be exhibited. Cases that show less than eight of these criteria are diagnosed as pervasive developmental disorder (PDD) not otherwise specified (NOS). Individuals who suffer from autistic disorder are normally not impaired in their motor skills. Hence, their repetitive behaviour cannot be attributed to that (APA 1987; cited by Blanken et al. 1993:805).

3.3.2. Asperger’s syndrome

Asperger’s syndrome (for further discussion see Chapter 7) was first discovered by Hans Asperger (1944) who called it “autistic psychopathy” (Asperger 1944). For a long time it was assumed that Kanner and Asperger described the same syndrome, but in 1981 Lorna Wing presented Asperger’s work to the English-speaking world and differentiated it from autism. Nevertheless, Asperger’s syndrome is a recent addition to DSM-IV and its differentiation from high-functioning-autism still causes much debate today (cf. Baron-Cohen 2008:23, Cummings 2008:184).

Individuals with Asperger’s syndrome show abnormalities in their behaviour as well as impairments in their social skills. For a particular diagnosis to be made, individuals must display:

“[...]marked impairment in the use of multiple nonverbal behaviours (e.g. eye-to-eye gaze, facial expression); failure to develop peer relationships appropriate to developmental level; a lack of spontaneous seeking to share enjoyment, interests or achievements with other people; and a lack of social or emotional reciprocity.”

(Cummings 2008:184-185).

Furthermore, they must display stereotyped patterns in their behaviour as well (cf. Cummings 2008:184 ff.).

In comparison to autistic disorder and other PDDs, language and communication skills are less impaired in individuals with Asperger's syndrome. Even the DSM-IV-TR (2000) stresses that there is no significant delay in language development and that their intellectual abilities lay in the normal range (APA 2000; cited by Cummings 2008:185).

3.3.3. Rett's syndrome

In 1966 Rett described a syndrome, which is found usually in girls who are initially often diagnosed as autistic. Initiating with a normal development and followed by regression, affected persons must display certain characteristics, including among others: deferment of head growth, stereotypic hand movements, poorly gait movements between the age of 5 months and 4 years, impaired expressive and perceptive language development and a diagnosis of Rett's syndrome until the age of 5 years.

Usually, individuals with Rett's syndrome suffer from mental retardation as well and sometimes they are wrongly diagnosed as autistic. Therefore, there is still disagreement about the syndrome's causes. It is generally assumed that both autistic disorder and Rett's syndrome are caused by a neurological abnormality. The question still remains, whether it is the same abnormality or not that causes these two disorders (cf. Blanken et al. 1993:807 ff., Cummings 2008:183 ff.).

3.3.4. Childhood Disintegrative Disorder (CDD)

Childhood disintegrative disorder (CDD) is a form of the autistic spectrum that is counted as a further PDD in which we can observe regression as well. According to DSM-IV-TR (2000), affected children show a typical development until the age of two years. Neither their communicative abilities, nor their social relationships and their behaviour seem to be impaired. With increasing age, children display abnormalities in the main characteristics of autistic disorder. In fact, there seems to be an overlap between CDD and Autistic Disorder, which could lead to a problem in the diagnosis. Often, children who are originally affected by

CDD are later diagnosed as autistic. Therefore, the prognosis for CDD is normally worse than that for autism (APA 2000; cited by Cummings 2008:184).

3.3.5. Pervasive Developmental Disorder (PDD)

Pervasive developmental disorder (PDD) not otherwise specified (NOS), also referred to as “atypical autism” shares a lot of similarities with classic autism and its diagnostic criteria. There has to be an impairment in the person’s social interaction or communicative behaviour. As mentioned before, affected individuals display many features of autism, but the difference concerns the later age of onset. According to DSM-IV-TR there are no specific diagnostic criteria for PDD, NOS (APA 2000; cited by Cummings 2008:185 ff.).

3.3.6. High-functioning autism

In fact, high-functioning individuals and children with autism show the same behavioural repertoire, but their IQ tends to be relatively high. Unfortunately, ICD-10 has not laid down specific diagnostic criteria yet, which makes a distinction amongst high-functioning autism and Asperger’s syndrome difficult. According to Klin et al. (1995), both syndromes differ in their neuropsychological skills (e.g. verbal expression, spatial perception, auditory perception, motor abilities etc.) (Klin et al. 1995; cited by Remschmidt 2008:51-52).

Nonetheless, it needs emphasising that both high-functioning individuals and people with Asperger’s syndrome show similar behaviour. Therefore, it may be more appropriate to focus not solely on differences, but on similarities too.

3.4. Delimitation of the autistic spectrum

3.4.1. Fragile X Condition

The appearance of the Fragile X condition in autism was first discovered by Brown/Jenkins/Friedman et al. (1982:304). According to Remschmidt (2008:26), approximately 4% of autistic individuals suffer from Fragile X condition and about 5 to 60% of individuals with Fragile X display autistic disorders.

Affected individuals display cognitive dysfunctions, are mainly male and many of them could be diagnosed as autistic. In 1989, Hagermann postulated that Fragile X condition could be a

cause for autism in children with organic etiology. According to him, 25% of autistic individuals are affected by organicity. The author argued as well, that individuals who suffer from Fragile X present in addition to prominent physical features (e.g. long face) a typical clinical documentation of PDD or autism. Concerning their social skills and language abilities, they demonstrate rapid anxiety, an avoidance of social gaze, perseveration and talking to themselves (cf. Hagermann and Sobesky 1989:144 ff.).

3.4.2. Autism versus Mental Retardation

A lot of authors have noticed the common occurrence of autism and mental retardation. In fact, they postulated that approximately 80 % of individuals affected by autism suffered from mental retardation as well. However, Kanner (1943) mistakenly thought that the two conditions were exclusive (cf. Blanken et al. 1993:806). Nevertheless, the question still remains, how far can we differentiate retardation without autism from the more common form of retardation accompanied by autism?

According to the key characteristics of autistic disorder, we can still observe differences in the occurrence of symptoms. First of all, autistic individuals show deficits in social interaction more severe than in their cognitive abilities. This does not follow to individuals who suffer from mental retardation. Furthermore, they do not display that lack of interest in people as we can observe in autistic people. Concerning their language and communication abilities, mentally retarded children seem relatively unimpaired in comparison to autistic children and also stereotyped behaviour is not often present (cf. Blanken et al. 1993:806).

3.4.3. Autistic-like disorders

Kanner (1943) and Asperger (1944) published their work about autism at almost the same time, but there has been recent interest in describing and differentiating the characteristics of Asperger's syndrome. For a long time it was assumed that there are no significant differences between Asperger's syndrome and high-functioning autism (HFA), another form on the autistic spectrum. Even today, the question still remains, how far do they differ from each other? Various authors have argued that Asperger's syndrome and high-functioning autism

can be distinguished from each other on the basis of impairments in their communication and social skills² (cf. Blanken et al. 1993:807).

As far as we can notice, these two forms do not differ in a marked degree from each other. Accordingly, the question still remains, why Asperger's syndrome cannot be seen as a milder form of the high-functioning autism continuum.

Another syndrome that should be mentioned in this context is schizophrenia. For a long time it was wrongly assumed that autistic people suffer from that syndrome or another form of psychosis instead of autism (cf. Papadimitriou 1997:39).

Nonetheless, we will notice in the following chapters that there are more than enough reasons why autism, in particular, Asperger's syndrome, shall be differentiated from any other form of psychosis or schizophrenia.

3.5. Epidemiology

Until 1980 the issue of autistic epidemiology was problematic, since there existed little agreement about the main symptoms of the syndrome. Regarding nomenclature, different studies used different diagnostic criteria and terminology. Actually, numerous early studies did this and mostly focused on the "Kanner-typical" and higher-functioning individuals, particularly those who did not show any neurological abnormalities. This may have been due to the etiologic view³ of that time. If we consider the predominant view of the seventies, autism was viewed as categorical. Therefore it is not surprising to find such confusion in terminology (cf. Blanken et al. 1993:805). How could they have identified exact diagnostic criteria, when there was not even agreement about the clinical picture?

Nevertheless, we should keep in mind that there exist different phenotypes of autism. As well, girls show different phenotypes than boys. So we can observe certain diagnostic differences that may influence the clinical picture in a different way. Regarding different classification systems, DSM III (1980) was the first one that applied an atheoretical point of view, offering explicit criteria for an appropriate diagnosis (cf. Gillberg and Coleman 1992:87, Blanken et al. 1993:805).

² These characteristics are more severe in individuals with high-functioning autism (cf. Blanken et al. 1993:807).

³ Bruno Bettelheim argued that psychogenetic factors were responsible for autism and that autistic individuals suffered from a biological intactness (cf. Blanken et al. 1993:805).

In the following section the most important studies on autistic epidemiology as well as prevalence rates between males and females shall be described. In fact, males show a higher prevalence in developing autism than girls. Clinical literature tends to attribute this to genetic factors, but this explanation is still undergoing debate.

3.5.1. Prevalence

Like mentioned previously, child psychiatrist Michael Rutter changed the prevailing view that autism was categorical. He distinguished it from other psychiatric and developmental disorders and went one step further to point out an appropriate classification system (cf. Baron-Cohen 2008:15 ff.).

Nonetheless, autism was still seen as a rare disorder and there was not much information about this relatively new condition. As we will observe soon, for the most part, Scandinavian researchers conducted the first studies concerning autistic epidemiology (cf. Gillberg and Coleman 1992:85 ff.).

The first study, based upon population was conducted by the Swedish scientist Victor Lotter. He distinguished the so-called forms of “nuclear” autism, which can be compared to the syndrome described by Kanner, and “non-nuclear” autism (classic Kanner-cases that show atypical traits). For the former group he stated a rate of 2.0 per 10.000 children and for the latter one a result of 2.5 per 10.000 children. Furthermore, Lotter examined a group of children (8 to 10 years old) who suffered from autism or autistic-like conditions and ascertained a rate of 7.8 per 10.000 children (cf. Lotter 1967:124 ff., Gillberg and Coleman 1992:85).

In 1966, one year before the study of Lotter was published, Rutter found 4.4 per 10.000 children (8 to 10 years old) who suffered from psychosis. These findings were later confirmed by other studies as well, in particular Lotter’s rate of 4 to 5 cases per 10.000 children, who suffered from childhood psychosis (Rutter 1966; cited by Gillberg and Coleman 1992:85).

Lotter’s study included not only school-children, but also those from other institutions. Even though there have been numerous studies carried out since then, Lotter’s investigation can still be considered as one of the ‘standard’ examples regarding autistic epidemiology (cf. Lotter 1967).

In 1979, Wing and Gould stated that the “triad of impairments” existed in 21 per 10.000 handicapped children (under the age of 15). These results were later confirmed in a study of

mentally impaired children in Goteborg. Since that time, the term “autistic traits” is used instead of “psychotic behaviour” (Wing and Gould 1979:17 ff). With respect to Asperger’s syndrome, Gillberg and Gillberg (1989) ascertained a rate of 26 per 10.000 school-age children. According to a total population study in Göteborg, it was suggested that 0.5 percent of all boys suffered from Asperger’s syndrome and another 0.5 percent remained undiagnosed (cf. Gillberg and Gillberg 1989:631 ff., Gillberg and Coleman 1992:87).

These studies give the impression that the more research was carried out, the more cases of autism and autistic-like conditions were discovered. As mentioned previously, this could be explained by the fact that diagnostic criteria as well as classification systems were renewed during the last years and also screening methods were modernized.

Actually, there exist some Swedish epidemiological studies discussing diagnostic criteria and examination that are of particular interest regarding this context. It became more and more obvious that there was an age-specific prevalence. Similarly, Gillberg (1986) also ascertained that four to five times as many children suffered from mental impairment as in the past (Gillberg et al. 1986; cited by Gillberg and Coleman 1992:88).

3.5.2. Current prevalence rates

With reference to more recent work, the Medical Research Council (2001) took a closer look at studies published by the year 2000. These studies ascertained an average prevalence of 10 per 10.000 children who suffer from autistic disorder and 2.5 per 10.000 individuals affected by Asperger’s syndrome (cf. Cummings 2008:186).

Frombonne (2003) confirmed these rates and reported furthermore less prevalence rates for individuals who suffer from childhood disintegrative disorder (CDD). Lower rates are reported for other PDDs too. Furthermore, he reported a rate of 15 per 10.000 cases for PDD, NOS (cf. Frombonne 2003:369 ff.). As we can see, this rate is much higher than in other PDDs. This may be attributed to the absence of exact diagnostic criteria. Hence, people with PDD, NOS are over-diagnosed, because there exist no specific diagnostic criteria for an appropriate diagnosis.

Concerning epidemiological examinations of autism spectrum disorders, we can find not only studies about the prevalence of these disorders, but also investigations concerning incidence. Williams et al. (2005) investigated the incidence of autism spectrum disorders in two Australian states between the period 1999 to 2000. They reported an increase, above all in the

0-4 years age group, and came to the conclusion that the disorder of autism is no longer a rare currence (Williams et al. 2005:110-111). This predication is confirmed by other epidemiological studies as well, as they play an important part in showing this increase.

Powell et al. (2000:626-628) reported an increase of 18 percent per year between the period 1991 to 1996, whereas a much larger increase was found for other PDDs. In addition, further investigations found out that autism appears four times as often as other diagnostic categories (e.g. epilepsy). Whilst the increase of autism amounted to 273 percent between 1987 and 1998, we can report an almost 2000 percent increase in other PDDs (cf. Cummings 2008:187). Unfortunately, there is no exact reason for that increase, but we may include certain factors such as renewed diagnostic criteria and better investigation methods to come to an explanation.

According to Remschmidt (2008:20), approximately 4 to 5 per 10.000 German-speaking children (4 to 15 years of age) suffer from autistic disorder. According to this rate, about 40.000 German inhabitants are autistic, amongst them 5000 to 6000 at the age of 4 to 15 years, approximately 3000 to 4000 between the age of 14 and 21 years and about 30.000 to 35.000 individuals over the age of 21. In addition, Remschmidt stressed that the reliability of the prevalence rates depends on the definition of the syndrome per se. Therefore, we may ascertain different clinical definitions and varying prevalence rates as well.

Based upon the Göteborg study, we come to the conclusion that more individuals suffer from Asperger's syndrome than from classic autism. Due to this fact, we might get the impression that these results only report a small part of the total individuals affected. The question still remains, if there exist weaker forms of Asperger's syndrome that do not show any clinical significance. Taking together all these factors indicate that there has been a significant increase of autism spectrum disorders in the last few years. In fact, this can be attributed to a better understanding and knowledge of autism per se. For example, not only do medical personal receive a better education, but also new examination methods and screening instruments have been discovered. Therefore, recent autistic epidemiology is more reliable and significant than in former times.

3.5.3. Sex ratios

There is clear evidence that more males than females suffer from autism. According to Gillberg and Coleman (1992:90), most of the studies reported a boy:girl ratio of 3:1 or 4:1.

Considering the fact that different syndromes occur in different severity, we can also notice different ratios (cf. Remschmidt 2008, Cummings 2008).

In comparison to Asperger's syndrome, a higher ratio of boys:girls occurs in autistic disorder. Most of the studies, which included all levels of IQ as well as exact case descriptions, postulated a low ratio. Combining these studies, we can observe an average ratio of approximately 1.5:1 to 2.8:1. In general, Scandinavian studies tend to report lower boy:girl ratios, but the reasons for that are still unclear (cf. Gillberg and Coleman 1992:90)

In Asperger's syndrome the ratio is distributed even higher than in classic autism. Gillberg and Gillberg (1989:135) postulated a ratio of 9 to 10:1 and in the last years we have also evidence that more males than females suffered from autism spectrum disorders.

The Californian Health and Human Services Agency showed an increase of 5.3 percent in the male population between the years from 1987 to 1998. As well, there seem to be differences in the IQ level. The ratio of children who suffered from a severe retardation (2.1:1) was lower than in children who showed impairments in their social and language abilities (cf. Cummings 2008:187 ff.).

All these findings show us that there are sex differences and that more males than females are affected by autism spectrum disorders. It is suggested, that this fact is linked to a sex-linked biological factor (for further discussion see Chapter 6).

3.5.4. Twin studies and sibling rank

A Scandinavian-Finnish study concerning the prevalence of autism in twins, suggested that autism occurs more often in the northern parts of these countries than in the South. In particular, they reported a higher prevalence in rural than in urban areas (Steffenburg et al. 1989:405). In opposition, Gillberg (1984) carried out a prevalence study in which a higher amount of people in urban than in rural regions were affected by autism (Gillberg 1984; cited by Gillberg and Coleman 1992:88).

In fact, these results might be explained by more comprehensive screenings in the urban area, but there is no reason why the prevalence would be higher in the rural country than in the city of Göteborg. One possible explanation might be that autism is viewed as a rare disorder and therefore, prevalence rates vary from one region to another, because of specific medical conditions, etc. Therefore, regional conditions might be responsible for these prevalence differences. Studies of prevalence within the family, in particular, concerning birth order of

autistic individuals, are still ambiguous. As we will see in the following chapters, the prevalence of autism is discussed within the subject of aetiology as well.

4. The symptoms of the autistic spectrum

4.1. Introduction

For an ASD diagnosis to be made, specific behavioural characteristics must be observed. As mentioned in Chapter 3, people with autism suffer from communicative, social, and imaginative skills. In fact, not only can these impairments, but also representative symptoms occur differently in affected individuals. In addition, some autistics show co-morbid conditions too. There is therefore, no exact clinical picture, which thus makes diagnosis more difficult. At the same time, we can also observe a difference in the onset of symptoms. Sometimes they appear very early, but either they are not noticed or are misinterpreted.

In the last few years, numerous listings of the most common features of the autistic syndromes have been published. Unfortunately, we still notice discrepancies in the number of symptoms necessary to make a diagnosis. Therefore, I will give descriptions of the most common features and try to outline the symptomatological differences between Kanner's and Asperger's syndrome. Diagnostic procedures and diagnostic criteria of the ICD-10 and DSM-V classification systems shall be introduced as well.

4.2. Common symptoms

Several characteristics of autism are unique to the disorder and offer a good insight into the different deficits. Symptoms, traits, and habits appear in different manners. It is therefore more important to gain an understanding about the most common symptoms and their occurrences in affected individuals. Thus, we are not only capable of having a better comprehension of the autistic mind, but are also able to make an appropriate diagnosis and develop adequate therapy methods.

In 1992, Gillberg and Coleman postulated that the disorder of autism can be linked to a “multiple disease entity”, in the sense, that autistic behaviour is represented by various aetiological factors. Different individuals are diagnosed by a different method, although they generally show similar symptoms. These findings have suggested that a common psychological denominator might be responsible for all these syndromes (Gillberg and Coleman 1992:17-20).

In 1988, Wing postulated that there are two different manifestations in the autistic syndrome that must be distinguished: either, postnatal problems occur, or normal development can be

reported until the first symptoms appear. We can also observe a difference in the onset of the symptoms. In some individuals, they occur quite early, but are often misinterpreted or not noticed. According to Wing, early indications can manifest themselves in problems such as nutrition, digestion, and severe sleeping disorders (Wing 1988; cited by Büttner 1995:7).

Affected infants neither are interested in their environment, nor in their parents who often recognise a problem very late. In 1994, Osterling and Dawson reported that approximately 50% of parents of a child diagnosed with autism noticed unusual behaviour before their child was one year old. This was the first time they raised their concerns to a paediatrician (cf. Osterling and Dawson 1994:247). Therefore, it is difficult to recognise and diagnose autism in young children just as difficult to demonstrate a common clinical picture of early development.

Retrospective research gained attention in the late 1980s and 90s and was highly significant, because it explored important methods to diagnose autism. Parents were asked to report abnormalities, which they could observe in their child's behaviour (cf. Ornitz, Guthrie and Farley 1977, Osterling and Dawson 1994).

At first sight, this seemed a good way of recording more about the early development in autistic children, but nonetheless, difficulties arose. Parents reported an event that took place a few years previously; hence, data may be inaccurate and it is not clear how exact their memories are. Furthermore, the correlation between autism and intellectual disability was still unclear at the time. This implies that it is not obvious that these reported abnormalities and delays can be ascribed or associated to autism.

Osterling and Dawson (1994:248-249) have suggested to study home videos, which parents had taken of their children. They interpreted videos of children who were later diagnosed with some type of childhood psychosis and a control group, which also included the behaviour of the mothers. In fact, this method still seems to be recognised by researchers and cannot only be applied to address autism, but also other issues.

Abnormal responses to sensory stimuli can be one of the most common symptoms in autism. In particular, an abnormal response to sound (e.g. cover their ears and eyes to avoid stimuli). Although it is not an official diagnostic criterion, most authorities agree that it can be one of the most common symptoms. It serves rather to differentiate autism from other disorders. Another common feature in autistic individuals is the reduced sensibility to pain and touch. Abnormal responses to visual stimuli might also be noticed, but not in such a severe extent.

Some authorities have suggested that the auditory and tactile channel may be more impaired than the visual or the olfactory canal (cf. Gillberg and Coleman 1992:30).

Masterton and Biederman (1983:147 ff.) suggested that the proprioceptive input gains more control than the visual one, but according to them, it can be seen as a tactical approach to compensate the absence of visual control. Therefore, some autistic individuals can talk coherently only when avoiding eye contact. Hyperactivity and sleeping problems are also noticed, especially in autistic infants.

It needs emphasising that there are some extraordinary talents that we can observe in the majority of autistic individuals, which are identified as “islets of ability”. Without any difficulty, autistic people are capable of learning whole books by heart, remembering a large amount of data or figure out complex arithmetic. Generally, we can observe these talents in the fields of art, music, or mathematics. Frequently, some autistic people are endued with a high amount of creativity in their language and can express themselves very well. Nevertheless, it should be mentioned that not every autistic person possesses these special abilities, but it can be observed in most affected (cf. Büttner 1995:11 ff.).

Throughout recent history, some researchers have tried to define a consistent cluster of symptoms that can be used in autistic diagnosis. Although terminology has changed, we can still find the same descriptions and characteristics, which researchers originally observed. Even Leo Kanner (1943) observed the same characteristics, which was discussed about:

„Die herausragende fundamentale pathognomonische Störung ist die von Geburt an bestehende Unfähigkeit, sich in normaler Weise mit Personen oder Situationen in Beziehung zu setzen. Die Eltern stellten diese Kinder vor und beschrieben sie als ‚selbstgenügsam, ‚wie in einer Schale lebend, ‚am glücklichsten, wenn sie allein gelassen wurden, ‚handelnd, als ob niemand anwesend sei, ‚nicht Notiz nehmend von ihrer Umgebung, ‚den Eindruck stiller Weisheit vermittelnd, ‚unfähig, das normale Maß an sozialem Gespür aufzubringen, ‚handelnd, als ob sie hypnotisiert wären.“

(Kanner 1943; cited by Remschmidt 2008:9)

Autistic individuals often show a lack of so-called “deictic gestures” (e.g. pointing), which are assumed by many theories of language acquisition as an important factor to develop normal communication. Furthermore, behaviour in child-play with peers seems to be also impaired. Obviously, autistic children seem to be more fascinated by objects rather than human beings. Therefore, it is common for them to concentrate their complete attention on a single object. Above all, this feature can end in an excessive passion for collecting objects, in which they are organised and assorted in size and colour.

This procedure, which is also referred to as stereotypic behaviour is an ongoing process and its' disorganisation often causes anger and aggression. However, we can observe this kind of behaviour in daily life as well. The daily routine of an autistic person is organised and planned and even the most minimal irregularity can lead to confusion and aggression in the child's behaviour (cf. Büttner 1995:9-10).

From this, one can assume that autistic individuals show problems with spontaneous actions. Their biggest fear seems to be a change in their daily habits and a loss of control. Therefore, we can deduce stereotypic actions and a lack of spontaneous actions not only in their linguistic behaviour, but also in their motor skills.

Wing (1988:7) mentioned that autistic children's motor skills are in general typically developed, but she reported a kind of clumsiness in their behaviour. In addition, they show an absence of pain perception in some extent, which conflicts with their obvious sensibility of contact. Zöller (1992) reported some kind of auto-aggressive behaviour (e.g. self-injuries) without any display of pain, whereas the touch of a parent causes panic (Zöller 1992; cited by Büttner 1995:10).

4.3. Cognitive profile and linguistic abnormalities

4.3.1. Joint Attention Dysfunction

Joint attention defines a cluster of socio-communicative abilities, which helps individuals to cope in social interactions. Certain capacities control these interactions between a child, an interactive partner and other aspects and are also referred to as "Joint attention behaviours (JA)" and "Triadic social interactions". During their primary years, children develop complex communication skills in order to master social interactions. Throughout this developmental period, one is able to notice different ways of realisation. Infants may initiate social interactions, or respond to social stimuli from others, whereas it depends on the communicative function. They may make use of nonverbal behaviour to get an object out of reach (e.g. eye contact, pointing) or combine several other forms of behaviour. These include the ability to coordinate attention between oneself, a social partner and the environment (or an object) (cf. Delincolas and Young 2007:425-427, Sheinkopf 2005:155-156).

According Sheinkopf (2005:155), this behaviour is referred to as 'joint attention', but is also termed as "protodeclarative" and in autistic research, it is a particular interest.

Above all, one can distinguish two different types of joint attention behaviours: the first type serves to start a joint attention interaction (e.g. pointing), whilst the second type occurs in response to the joint attention of another person (e.g. following a point). The former is also referred to as “initiating joint attention (IJA)”, whilst the latter is termed as “responding to joint attention (RJA)”. In fact, autistic individuals show severe deficits in their ability to initiate joint attention, as well as in their capacity to respond to joint attention of others (cf. Sheinkopf 2005:155).

As already mentioned, one can also report impairments in deictic gestures (e.g. pointing) and the coordination of eye contact, which can also be ascribed to joint attention abilities. In fact, joint attention deficits contribute to a major part of our understanding of autism. Through specific investigations, we are able to identify this disorder and to develop appropriate diagnostic methods. These abilities play an important factor in the development of language, cognitive and socio-communicative abilities.

4.3.2. Theory of Mind

The Theory of Mind symbolises one of the core capacities that makes us human. Although we cannot see states of mind, we are capable to infer them through logic (e.g. emotions, beliefs, imagination, intentions etc.). Thus, we are able to reason about our own and others’ mental states and comprehend that our beliefs and intentions are different from theirs’. We are capable of imagining others’ thoughts and predicting their behaviour (cf. Baron-Cohen 1995:3, Frith 2003:77).

Thanks to an article in 1985, entitled “Does the autistic child have a ‘Theory of Mind’”?, Baron-Cohen, Frith and Leslie became some of the pioneers in investigating ToM. During this time, other researchers undertook similar investigations and became successful in the fields of developmental psychology and psychopathology. In fact, the alliance between these two fields permits an interdisciplinary approach for current research (cf. Baron-Cohen, Leslie and Frith 1985, Frith and Happé 1994:115-116).

In early childhood, every human being has to learn specifics about the world around him. Children are capable of doing this, because their brains allow them to build up copies and representations of people, events, and things that they gained from their experiences. By the age of two, they are able to build representations of other people’s intentions due to an innate mechanism within their brain (cf. Frith 2003:81).

According to Leslie (1987:413-414), this mechanism restricts representations from the real world; hence, they no longer represent reality and can be applied to people's thoughts and intentions. By the age of five, the whole process is nearly finished and children will almost have acquired a fully developed ToM. Frith (2003:77 ff.) argues that the Theory of Mind may be perceived as a specialised mental tool that every normal developed human being uses to varying degrees. According to Frith, this process can be perceived as an unconscious activity. Therefore, she prefers the term "*mentalizing*", because it does not necessarily imply a conscious process.

In comparison, Baron-Cohen (2008:57 ff.) employs the term "*mind reading*" and claims it as a theory. He proposes that individuals who suffer from autism and Asperger's syndrome show a delay in their development of their ToM, and furthermore show different levels of "mindblindness" (e.g. impairments in joint attention, pretend play etc.). For example, some children are not capable of solving the "false belief"⁴ test and are slow to become aware of deception. According to Baron-Cohen, this theory can explain the social and communication impairments in autistic individuals and can be applied to the autistic spectrum. However, a deficit in the ToM may not be specifically associated with these individuals.

Thus far, we can conclude that the experiments of the ToM account may help us to understand the exact nature of impairments in communication, social interaction and play situations in autism. Research still concentrates on the involved processes that support this activity in normal development. Nonetheless, the question still remains, why do autistic individuals fail to attain ToM and how well does this concept explain autism?

It has become widely accepted that a lack of a theory of mind is present in autistic individuals. Many researchers agree with the so-called "*mindblindness hypothesis*" since it explains certain impairments in social communication. The hypothesis of Frith was first examined in the early 1980's, under the assumption that infants are born with innate mechanisms, which allow to accumulate knowledge about the world (cf. Frith 2003:80). Leslie (1987:413) argued further that these mechanisms allow us to understand pretence. If these mechanisms did not work, development would fail and cause autism.

Moreover, many authors proposed joint attention as a precursor ability and an early indicator of Theory of Mind. They claimed that every child has to possess the ability to understand the

⁴ This test purposes children to figure out the concept of 'false belief' in using a short story about two dolls (Sally and Anne). The child is told that '*Sally hides her marble in the box, but when Sally goes out, naughty Anne moves the marble to the basket*'. At the end, the child is asked '*Where will Sally look for her marble?*' (Baron-Cohen 2008:58).

other's unique point of view. Unfortunately, there is little empirical evidence for this assumption (cf. Sheinkopf 2005:156).

4.3.3. Executive Dysfunction

Executive functions (EF) are defined as a class of cognitive abilities to regulate action and thought, including motor actions (e.g. movements, attention etc.), impulse control, strategic planning, working memory and other functions. Concerning the autistic spectrum, a lack in forward planning and shifting attention are seen as one of the core impairments (cf. Murray et al. 2005:139, Sheinkopf 2005:156, Baron-Cohen 2008:52).

Some authors suggested that the frontal lobes play an important role in the development of these functions. Hill (2004), as well as Baron-Cohen (2008) both reported a general impairment in executive functions in patients with damaged frontal lobes. Whilst autistic individuals do not suffer from a damage in this area, it is suggested that it may not have developed in a typical way (cf. Sheinkopf 2005:156, Hill 2004:26, Baron-Cohen 2008:52).

Individuals, suffering from autism and Asperger's syndrome have been investigated within using the "Tower of London Test" and tests of verbal fluency. With regard to the former test, individuals with Asperger's syndrome were found to perform in a better way than subjects with autism and other clinical groups. Within the latter test, the affected individuals on the autistic spectrum also showed worse results (cf. Baron-Cohen 2008:52, 53).

It is important to highlight here the fact that executive dysfunction also appears in other neurodevelopmental disorders (e.g. Tourette's syndrome, schizophrenia, ADHD etc.) (cf. Hill 2004:26).

Unfortunately, we do not have sufficient evidence to prove that executive dysfunction is specific to members of the autistic spectrum. In addition, there is the impression that autistic spectrum individuals show a huge variation in their symptoms (cf. Baron-Cohen 2008:53).

4.3.4. Weak central coherence

Central coherence refers to the ability in integrating information in order to create a coherent, global picture. It is suggested that people on the autistic spectrum show a deficit in this ability. They are said to fail in extracting global information and instead, focus on details;

hence, their minds are supposed to have weak central coherence (cf. Baron-Cohen 2008:53-54).

In 1989, Frith explored the concept of central coherence in typically developing children and adults. In doing this, she drew attention to tasks in which the participants had to process incoming information for meaning and form (e.g. details, surface structure). Termed as “drive for meaning” by Bartlett (1932), this concept was renamed “central coherence” by Frith (1989). In order to understand the cognitive profile of individuals with autism, Frith and Happé combined the concept of central coherence with the Theory of Mind approach (Bartlett 1932, Frith 1989; cited by Happé and Frith 2006:5-6).

In fact, the central coherence account has gained more interest due to the work by Frith and Happé. Since then, this concept has been challenged in three different ways. Firstly, the original view of a core deficit in central processing has been abandoned. Instead, it is assumed as a possible superiority in detail-focused processing. Secondly, we may speak of a processing bias, rather than a deficit. Finally, weak coherence may demonstrate one aspect in the cognitive profile of autism, rather than explaining impairments in social cognition (cf. Happé and Frith 2006:6).

In spite of this, the central coherence account also addresses other concepts, such as islets of ability, lack of generalization etc. With regard to empirical studies, there have been inconsistent findings. Baron-Cohen (2008:54) reported that people on the autistic spectrum tended to be faster at the “Children’s Embedded Figures Test”⁵. Instead, Happé (1996:875) and Ropar and Mitchell (2001:547) suggested different findings. Also, on the “Navon Hierarchical Figures Test”, (e.g. an A composed of small Hs) autistic individuals tend to see the letter H, rather than the letter A.

These findings draw our attention to the fact that people on the autistic spectrum may have superior processing capacities for smaller details than typically developing children. Nonetheless, it does not necessarily imply that autistic individuals are not aware of the overall concept. Therefore, research has to specifically focus on which level this difficulty with integrating information occurs.

In addition, a connection to neurological theories (e.g. the connectivity theory) was suggested. This theory proposes that people on the autistic spectrum have not solely a so-called “short-range overconnectivity” (more neurons making connections in the brain), but also a “long-

⁵ People are asked to find the target shape that is hidden in a larger design (cf. Baron-Cohen 2008:54).

range underconnectivity” (fewer neurons making connections between different brain areas) (cf. Baron-Cohen 2008:56).

4.4. Triad of Impairments

In 1979, Wing and Gould introduced the expression “triad of impairments” for describing the most prominent impairments in autistic spectrum disorders. They distinguished three main groups and numerated them from the most to the least severe ones. Nonetheless, the authors noted that these impairments present merely a selection along a continuum and may be ascertained from other clinical pictures as well (cf. Wing and Gould 1979).

Wing (2006) postulated the following components:

- “Impairments of Social Interaction”: The capacity to interact with others is growing in the development from birth in normally developing infants. Impairments in this ability are now ascertained as one of the major deficits in autistic individuals.
- “Impairment of social communication”: Social communication means the capacity to act not only with verbal, but also with non-verbal language (e.g. giving and receiving signs). In addition, it also means the ability to exchange feelings and ideas, is normally observed in the first two months of life. During this time, the infant initiates to take part in conversational exchanges (e.g. smile, movement, noises). In general, autistic individuals, those who develop speech, are capable of expressing their needs, but there is no other form of communication. They make comments, which often are often not relevant to the social context; thus, one can also conclude an absence of reciprocal communication.
- “Impairment of social imagination”: It has already been mentioned that autistic individuals show abnormalities in “pretend play” situations with peers, which can be referred to this group of impairments. A child might be able to imitate other children’s play actions, but there will not be any sign of spontaneous action. Concerning this, one can notice a large amount of stereotypic behaviour. These abilities include the capacity to imitate other people’s actions as well as the ability to estimate their Theory of Mind. Affected individuals might be able to infer that something goes on in other peoples’ minds, but have no understanding of what it is exactly. In general, the development of these abilities can be observed in the second and third years of life (cf. Wing 2006:8-10).

In addition, Wing and Gould (1979) reported impairments in repetitive behaviour and psychological functions. According to them, the existence of the triad is the crucial factor for the diagnosis of an autistic spectrum disorder (cf. Wing and Gould 1979:17 ff.).

Even if terminology has changed over the years, one can still notice the same clusters of impairments reported in other authors' descriptions. Gillberg and Coleman (1992) referred to them as

“Abnormality of social relatedness; Abnormalities of communication development including language; and Restricted, repetitive and stereotyped behaviour, activities and interests.”

(Gillberg and Coleman 1992:22 ff.)

4.5. Diagnostic criteria

4.5.1. Introduction

It has been widely debated, how far Asperger's syndrome can be distinguished from autism (see Chapter 7). Various authors suggested that autism and Asperger's syndrome differ in the degree of impairment. As mentioned previously, individuals on the autistic spectrum suffer from impairments in social interaction, communication, imagination and repetitive activities. However, clinical work has found that many individuals show varying features of these syndromes (cf. Leekam et al. 2000:11).

Specific diagnostic criteria have been suggested by other authors since the publications of Kanner and Asperger. The ICD-10 research criteria (WHO, 2007) are similar to those described by DSM-IV-TR (APA, 2000) and focus on the main symptoms (as listed above). Although we can notice an overlap in these criteria, there are also discrepancies (cf. Leekam et al. 2000:11).

As regards Asperger's syndrome, ICD-10⁶ (2007) does not mention impairments of non-verbal communication and language abnormalities. In contrast, Asperger (1944:40 ff.) mentioned both of these characteristics. He described not only the children's vocabulary, but also noticed their inappropriate use of speech and intonation. Furthermore, Asperger characterised his syndrome in a very vivid way, but unfortunately, he did not lay down diagnostic criteria.

⁶ (c.f. WHO (2007): <http://apps.who.int/classifications/apps/icd/icd10online/>)

It is obvious that the definition and diagnosis of autism is still a controversial matter. Numerous books have added other definitions and diagnosis since the publication of Kanner and Asperger. Therefore, it is almost impossible to get a general idea.

4.5.2. ICD-10

Since the early 1960s, the Mental Health Programme of the World Health Organization (WHO) occupies itself with the diagnosis and classification of mental disorders. With regard to the 10th edition of the Manual, researchers and clinicians of 40 countries participated in the compilation of that document.

As regards autistic disorder, ICD-10 (WHO 1993) cites the following criteria⁷:

“A. Presence of abnormal or impaired development before the age of three years, in at least one out the following areas:

- (1) Receptive or expressive language as used in social communication;*
- (2) The development of selective social attachments or of reciprocal social interaction;*
- (3) Functional or symbolic play.*

B. Qualitative abnormalities in reciprocal social interaction manifest in at least one of the following areas:

- (1) Failure to adequately use eye-to-eye gaze, facial expression, body posture and gesture to regulate social interaction;*
- (2) Failure to develop (in a manner appropriate to mental age, and despite ample opportunities) peer relationships that involve a mutual sharing of interests, activities and emotions;*
- (3) A lack of socio-emotional reciprocity as shown by an impaired or deviant response to other people’s emotions; or lack of modulation of behaviour according to social context, or a weak integration of social, emotional and communicative behaviours.*

⁷ For further information see <http://www.who.int/classifications/icd/en/GRNBOOK.pdf>

C. Qualitative abnormalities in communication, manifest in at least two of the following areas:

(1) A delay in, or total lack of, development of spoken language that is not accompanied by an attempt to compensate through the use of gesture or mime as alternative modes of communication (often preceded by a lack of communicative babbling);

(2) Relative failure to initiate or sustain conversational interchange (at whatever level of language skills are present) in which there is reciprocal to and from responsiveness to the communications of the other person;

(3) Stereotyped and repetitive use of language or idiosyncratic use of words or phrases;

(4) Abnormalities in pitch, stress, rate, rhythm and intonation of speech;

D. Restricted, repetitive, and stereotyped patterns of behaviour, interests and activities, manifest in at least two of the following areas:

(1) An encompassing preoccupation with one or more stereotyped and restricted patterns of interest that are abnormal in content or focus; or one or more interests that are abnormal in their intensity and circumscribed nature although not abnormal in their content or focus.

(2) Apparently compulsive adherence to specific, non-functional, routines or rituals;

(3) Stereotyped and repetitive motor mannerisms that involve either hand or finger flapping or twisting, or complex whole body movements;

(4) Preoccupations with part-objects or non-functional elements of play materials (such as their odour, the feel of their surface, or the noise or vibration that they generate);

(5) Distress over changes in small, non-functional, details of the environment.

E. The clinical picture is not attributable to the other varieties of pervasive developmental disorder; specific developmental disorder of receptive language (F80.2) with secondary socio-emotional problems; reactive attachment disorder (F94.1) or disinhibited attachment disorder (F94.2); mental retardation (F70–F72) with some associated emotional or behavioural disorder; schizophrenia (F20) of unusually early onset; and Rett’s syndrome (F84.2). ”

(World Health Organization 1993:179 ff.).

For a diagnosis of Asperger's syndrome, the following criteria must be met:

"A. A lack of any clinically significant general delay in spoken or receptive language, or cognitive development. Diagnosis requires that single words should have been developed by the age of two or earlier and that communicative phrases should be used by the age of three or earlier. Self-help skills, adaptive behaviour and curiosity about the environment during the first three years should be at a level consistent with normal intellectual development. However, motor milestones may be somewhat delayed and motor clumsiness is usual (although not a necessary diagnostic feature). Isolated special skills, often related to abnormal

preoccupations, are common, but are not required for diagnosis.

B. Qualitative abnormalities in reciprocal social interaction (criteria as for autism).

C. An unusually intense circumscribed interest or restricted, repetitive, and stereotyped patterns of behaviour, interests and activities (criteria as for autism; however it would be less usual for these to include either motor mannerisms or preoccupations with part-objects or non-functional elements of play materials).

D. The disorder is not attributable to the other varieties of pervasive developmental disorder; schizotypal disorder (F21); simple schizophrenia (F20.6); reactive and disinhibited attachment disorder of childhood (F94.1 and .2); obsessional personality disorder (F60.5); obsessive-compulsive disorder (F42). "

(World Health Organization 1993:186 ff.)

It is important to highlight the fact that people on the autistic spectrum cannot be categorised as a homogenous group. Therefore, clinicians should consider these individual differences

within their diagnosis and therapy. Furthermore, both systems, DSM-IV and ICD-10, include not only autistic disorders, but also other developmental disorders in their classification (see Chapter 3).

4.5.3. Prognosis and clinical course

In autism, one can also observe a symptomatological change in relation to age. Symptoms and behaviour that could appear similarly in children at the age of 18 months may completely have changed by the time they are 10 years old. For this, early observation is vital for establishing a precise diagnosis.

Typical autistic behaviour is the most evident during the period from 2 to 6 years. In contrast to autistic infants, typically developing children have acquired some kind of spoken and communicative language by the age of two. Autistic individuals fail in developing relationships with other peers and are recognized as abnormal for the first time. Later, during their preschool period we can definitely observe one of the main symptoms, which are namely, 'extreme autistic aloneness'. In comparison, individuals with forms of higher-functioning autism develop at least some kind of spoken language.

During the period of puberty and adolescence, difficulties still occur within autism and Asperger's syndrome. Psychiatric problems and other impairments, such as epilepsy are the most common symptoms. In addition, some autistic people suffer from deterioration, depression, problems associated with sexual maturation etc.

In general, the majority of affected individuals will show these impairments throughout life, especially psychiatric ones. Only a few of them will be capable of leading an almost independent life (cf. Gillberg and Coleman 1992).

5. Aetiology

5.1. Introduction

Since Kanner's and Asperger's time, quite some theories have been put forward to explore the causes of autism. For some time, the scientific research community was concerned with describing the condition per se in order to determine its possible trigger. Through the application of knowledge and methods taken from scientific fields such as genetics, biochemistry and neuropsychology, a multitude of hypotheses have been established. Gradually, progress has been made not solely by using modernised investigation-methods, but also in the discovery of new imaging techniques (EEG, PEG, CT, MRI etc.). As the century has advanced, science has looked forward to the discovery of particular genetic aberrations and brain abnormalities, which may be seen as a causing factor of autism. However, whether autism can be attributed to a single causing factor or not is still a matter for discussion.

Contemporary research tends to integrate not only biological, neurobiological or genetic factors, but environmental components too. In fact, the aetiology of autism research should no

longer be fixed on the discovery of a single trigger. Perceiving its origin in a multi-factorial component may be more useful.

5.2. Early research

5.2.1. The psychogenetic approach

Both Kanner and Asperger assumed autism to be the consequence of biological abnormalities. They described the children's parents as highly educated and intelligent. Furthermore, Kanner suggested that autism would originate due to an innate disturbance. Asperger described not only the children's, but also the parent's behaviour and noticed similar features amongst them (cf. Kanner 1943, Asperger 1944). Although Kanner had already discovered deficits in the children's linguistic skills, psychogenetic theories gained the upper hand (cf. Frith 2003:5).

In 1964, the psychoanalyst Bruno Bettelheim identified insufficient parental care as a factor of prime importance. In particular, he blamed the so-called "refrigerator mother" for refusing her child affection and tenderness. Bettelheim clearly denied an innate disturbance as a causing factor and argued that the condition of autism would become apparent by the age of two. According to him, autistic children acquire their language without any deficits until difficulties become obvious (cf. Baron-Cohen 2008:85 ff.).

Later, in 1983, the ethologist Nikolaas Tinbergen mentioned anxiety as a causing factor for autism. In particular, he suggested that a brief separation from the mother could cause this kind of emotion. In addition, he blamed (like Bettelheim) the mothers and suggested that autism emerged from addiction (e.g. drugs, alcohol) during pregnancy. In the 1970s, psychogenic theories were rejected. Medical conditions, which could not be put down to purely psychological components became apparent (e.g. epilepsy) (Tinbergen and Tinbergen 1983; cited Baron-Cohen 2008:85-86 ff.).

5.2.2. Genetic factors

As regards new medical techniques, progress has been made within the last decades. Not only empirical studies, but also modernised investigation instrumentalities, allow these advances. Therefore, a multitude of studies have been established to determine possible genetic factors in autism. The question of whether autism has a purely genetic origin, or if there exist certain components (e.g. cognition, language), which transmit the disorder has been widely

discussed. In fact, most empirical evidence has been presented by family and twin studies (cf. Gillberg and Coleman 1992:96, Papadimitriou 1997:48, Cummings 2008:188).

According to Edelson and Saudino (2009:255), three to ten per cent of siblings of autistic individuals are said to be autistic. Although this number appears to be low, the risk should not be underestimated when considering the rate of autism. Indeed, the risk of autism is much more frequent in siblings of autistic individuals than in the general population. Additionally, specific impairments concerning cognitive abilities (e.g. language impairments) were reported too (cf. Gillberg and Coleman 1992:98, Remschmidt 2008:29, 30).

In 1977, Folstein and Rutter laid down the first population-based twin study in Great Britain. They investigated twenty-one twin pairs (same-sex) in which at least one sibling suffered from autism. The authors reported a concordance rate of 36 per cent in monozygotic twins. In contrast, they found a rate of 0 per cent in the dizygotic twins. Furthermore, particular cognitive impairments (e.g. reading, language delay and spelling) were also examined. In doing so, they reported 82 per cent of the monozygotic pairs and 10 per cent of the dizygotic ones to be concordant (Folstein and Rutter 1977:315).

However, it has been suggested that genetic factors (or certain chromosomal abnormalities) must be involved in the emergence of autism. Due to an absolute concordance between monozygotic twins, it was suggested that particular environmental components (e.g. pre- or perinatal complications) may be of utmost importance too (cf. Bauman and Kemper 1994:21-22, Edelson and Saudino 2009:255-256).

As regards language deficits, the first study was carried out by Bartak, Rutter and Cox (1975:127). The authors reported impaired language and reading skills in at least one family member (5 out of 9 families). Specifically noticed were impairments in pragmatic and narrative discourse abilities.

With regard to Asperger's syndrome, research focused not only on genetic factors, but also on brain abnormalities and environmental components. Ylisaukko et al. (2004:164) claimed that almost the same genes that are supposed to cause Asperger's syndrome can also be observed in schizophrenic disorders.

5.2.3. Biochemical findings

As previously mentioned, autism is assumed to be the consequence of impaired interaction between genetic factors and environmental components. These environmental factors include viral infections, vaccinations and perinatal complications (cf. Gillberg and Coleman 1992, Baron-Cohen 2008, Remschmidt 2008).

Various authors suggested that autism may be the result of mercury poisoning, which can be related to vaccines. Bernard et al. (2001:467) claimed that this toxicity may cause autistic behaviour. In order to disprove this hypothesis, Williams et al. (2008:172) conducted a study, investigating mercury levels in children who suffered from autism and a control group. In fact, there were no significant differences between the two groups. According to Nelson and Baumann (2003:677), mercury poisoning causes certain other conditions (e.g. dysarthria, depression, anxiety, ataxia etc.). In fact, autistic individuals are not supposed to show any of these manifestations.

In 1999, Wakefield suggested a causal relationship between autism and the measles, mumps and rubella (MMR) vaccine (Wakefield 1999; cited by Cummings 2008:191). With regard to this, Kaye et al. (2001:462) conducted a study and found out that there was no significant correlation between the MMR vaccination and the emergence of autism. These findings were confirmed by the Medical Research Council.

Furthermore, Schain and Freedman (1961) found out that 6 out of 23 children with autism showed an overproduction of Serotonin⁸ in their blood (Schain and Freedman 1961; cited by Gillberg and Coleman 1992:115 ff.). It was then in 1990 that Cook reported a percentage of over 25% who suffered from hyperserotoninaemia. This finding has also been confirmed by other authors (cf. Cook 1990:292).

However, the discovery of increased Serotonin has stimulated most of the research in the field of Bio- and Neurochemistry. Coleman (1973) reported that also children who suffered from Down's syndrome showed this condition. The same result has also been found in schizophrenia and other neurological diseases (Coleman 1973; cited by Papadimitriou 1997:52). In fact, it is still unclear which effect increased serotonin results may cause in autistic individuals.

⁸ Serotonin is a monoamine neurotransmitter, synthesized in the serotonergic neurons in the central nervous system, as well as in the gastrointestinal tract. It plays an important role in regulating anger, aggression, mood, sleep and appetite (cf. Baron-Cohen 2008:90).

As mentioned previously, Serotonin is involved in the regulation of sleep. In 1993, Janetzke suggested that autistic individuals suffer from sleeping disorders. Nonetheless, it is unclear as to how far one can link sleeping disorders to an overproduction of Serotonin as it might also be a consequence of increased levels of Melatonin (Janetzke 1993; cited by Büttner 1995:30).

Another debate concerns the involvement of special hormones and peptides. As mentioned in chapter two, more males than females suffer from autism. Baron-Cohen (2008:93) suggested that sex-related hormones (e.g. testosterone and oestrogen) play an important role in certain functions. Foetal testosterone, a special form of testosterone, is supposed to cause masculinisation in the brain. It has been observed that children with higher levels of this hormone tended to show difficulties in language development.

5.3. Brain abnormalities

The assumption that autism is linked to certain brain abnormalities became evident in the last few years. Sophisticated neuroimaging techniques (e.g. MRI, fMRI etc.) do not just show pictures of the inside of the brain, but also its activity while the individual is acting. In fact, several neurological conditions can also be considered as a sign of brain abnormality in autism (cf. Frith 2003:182). The question remains to what extent these neurological deficits can be determined as causal factors for autism. May the system of the brain itself provide an explanation or should we focus on single neurons and their interconnections?

Some of the most striking findings from post-mortem studies consisted of cell density, smaller cell size in several brain areas, increased head circumference and increased brain volume (cf. Bauman and Kemper 1994, Frith 2003, Baron-Cohen 2008).

In 2001, the Medical Research Council confirmed these findings and postulated that the following abnormalities can be observed the most in autistic individuals:

“increased brain weight, decreased Purkinje cell number and developmental abnormalities of the inferior olive.”

(Cummings 2008:189).

In fact, the first two years of life are of overwhelming importance as far as brain development is concerned. During this time, connections between neurons, synapses and brain cells start to grow. This whole process is determined by certain gene programs and cannot be completed if the communication between these interactions does not work. However, children possess quite a large amount of connections between their brain cells and a

higher number of neurons than adults. During infancy, the brain experiences different levels of growing, in which existing connections are eliminated, but organised again. This process is not controlled solely by genes, but also by environmental components (cf. Frith 2003:184, Mraz et al. 2007:700).

According to Frith (2003:184-185), a lack in this ability may mostly affect top-down processing systems as they are controlled by neural feedback connections. In contrast, bottom-up processing systems depend on neural feedforward connections, which are possibly set down earlier during development. Thus far, one may conclude that incomplete top-down systems fail in modulating bottom-up systems, which may be assumed as a possible reason for the non-social characteristics of autism. By the age of 18 months, infants arrive at an important phase in developing and pruning synapses and their connections. This phase of elimination and reorganisation seems to be delayed in autistic infants and may also affect other brain regions.

5.3.1. Head circumference

In fact, individuals with autism show on average larger brains than typically developing children. Affected children experience a phase of brain overgrowth (macrocephaly) during their first years of infancy. Evidence comes from post-mortem studies, measurements of head circumference and brain scanning. It is plausible that this overgrowth may be caused by an overproduction of neurons and connections between them and affects on average about 20 per cent of autistic children (cf. Herbert 2005:418, Mraz 2007:701).

According to Cummings (2008:190), increased brain size in autism tends to decrease in relation to age; hence, solely a low percentage of autistic adolescents and adults suffer from macrocephaly. Aylward et al. (2002) found out that not only brain size, but also head circumference was larger in autistic individuals under the age of 12 (Aylward et al. 2002; cited by Herbert 2005:427).

With regard to head circumference, autistic children do not show any abnormalities until they reach the age of three. Furthermore, there is supporting evidence that individuals with Asperger's syndrome develop macrocephaly during early childhood (cf. Gillberg and de Souza 2002, Mraz 2007, Cummings 2008).

5.3.2. Cerebellum

The cerebellum is an important brain structure, which is located at the back of the brain. It is supposed to regulate not just motor functions (e.g. movement), but also several cognitive functions (e.g. emotion, attention shifting, thought). Given that language production can also be viewed as a sequenced movement, the cerebellum may be linked to the regulation of motor actions in language. Current research indicates that not only language production, but also linguistic processing, word association and word memory are controlled by this part of the brain (cf. Schroeder et al. 2010:557).

As mentioned previously, attention shifting is one of the cerebellum's major areas of responsibility. As autistic individuals show deficits in this ability, one may assume that abnormalities in the cerebellum may be linked to it. Furthermore, the inability to shift attention may result in repetitive and stereotyped behaviour (another typical feature of autistic individuals) (cf. Frith 2003:189, Schroeder et al. 2010:558 ff.).

A large body of research reports a decrease in the number of specific cells, namely the Purkinje cells, which are located in the vermis⁹. According to the MRC (2001), this decrease takes place either during the prenatal period or in the postnatal phase (cf. Cummings 2008:190).

Furthermore, it was noticed that the volume of the cerebellum was linked to the volume of the frontal lobes. In fact, dysfunction in one area may cause abnormalities in the other region as they are highly inter-connected. In particular, the authors found smaller frontal lobes and a bigger size in the cerebellum (cf. Schroeder et al. 2010:556).

5.3.3. Frontal lobes

The frontal lobe is responsible for executive functions such as planning, organisation, working memory and many others. Research suggested that these skills seemed to be impaired in autistic individuals. In fact, the frontal lobe is also involved in language production as Broca's area is located in the inferior prefrontal lobe. Actually, affected individuals do not only show deficits in communicative behaviour (e.g. in pragmatics), but also in other cognitive abilities (e.g. Theory of Mind) (cf. Schroeder et al. 2010:560).

⁹ An area that receives auditory and visual information (Schroeder et al. 2010:558).

In 1999, Baron-Cohen et al. conducted an fMRI study with high-functioning individuals in order to explore their neurological functioning. Within this study, participants were asked to describe expressions and mental states of other individuals. The author's aim was to investigate the neurological processes and brain regions which affected individuals activate. In fact, they reported activation in the inferior frontal gyrus and the amygdala in the control group, whilst autistic individuals activated the temporal lobes (cf. Baron-Cohen et al. 1999:1891 ff.).

5.3.4. Temporal lobe

The temporal lobe controls functions such as memory, object perception and audition. Furthermore, it is responsible for receptive language as Wernicke's area is located in the posterior part of the temporal lobe. Within the temporal lobes one can discover structures like the amygdala and the Hippocampus, which control learning, memory and emotional behaviour. In particular, several other functions (e.g. joint attention, empathy, action observation etc.) play an important role too. Furthermore, cortical thinning in some parts of the mirror neuron system¹⁰ was reported in high-functioning individuals. This area includes functions such as body movement and motor action (cf. Schroeder et al. 2010:561-562).

However, amygdaloid structures are connected with several areas in the frontal and temporal part of the brain. Although a dysfunction of the amygdala in autism has not yet been proven, research has already investigated these structures in very young rhesus monkeys. After the resection of the amygdala, a change in behaviour was observable (e.g. lack of social interest, expressionless faces etc.) (cf. Frith 2003:190 ff.).

5.3.5. Left-hemisphere Dysfunction

Brain lateralisation and a possible dysfunction of the left or right hemisphere in autism have always been a matter of discussion. In 1987, Hermle and Oepen took measurements of the frontal and occipital part of the brain and reported an asymmetry in these two areas. Within their study, participants showed good results in linguistic tasks, but worse results in their non-

¹⁰ Mirror neurons act as emulators, which fire when the observer watches someone else perform actions, essentially creating a reproduction of the sensory output that would be involved if the individual was producing the same actions themselves. This concept stems from Rizzolatti and colleagues' (1996) single-cell recordings of the F5-premotor cortex of macaque monkeys. They found that this region was activated both when observing actions and when executing actions (cf. Schroeder et al. 2010:557).

linguistic and visual-motoric abilities. According to the authors, autistic individuals seemed to suffer from right-hemisphere dysfunction (cf. Büttner 1995:25, 26).

As previously mentioned, autistic individuals show deficits in certain aspects of language. Therefore, many other authors have focused specifically on left-hemisphere dysfunction as several impairments appear to be associated with deficits in cognitive functioning. In contrast, Fein et al. (1984) suggested that the following points speak against a left-hemisphere-language basis for autism:

- 1. The variability of language deficits and delays in different groups of autistic children.*
- 2. Certain aspects of language (phonology, syntax) are delayed rather than deviant in many cases.*
- 3. Other language features (prosody, pragmatics) suggest right-hemisphere dysfunction.*
- 4. There are abnormalities in perceptual functioning.*
- 5. Not all autistic children have verbal deficits out of proportion to perceptual deficits.*
- 6. Task demands and information processing differences may confuse the attempts at differentiating linguistic and verbal tasks.*

(Fein et al. 1984; cited by Golden 1987:144).

5.4. Neuropsychological research

Thanks to neuropsychological investigations, much progress has been made in autism research. In particular, the work of Baron-Cohen, Frith and Leslie during the 1980s influenced the current image of autism the most. The authors investigated the children's development of a "Theory of Mind" and focused on the discovery of neuropsychological features in autistic individuals. As mentioned in Chapter 3, some of the most prominent features in autism involve deficits in language and social communication and are associated with several cognitive functions. Therefore, it is of common interest to explore to what extent not only social, but also cognitive deficits in autism arise from one common trigger. In fact, this concern is quite problematic as it depends on our terminological usage. Technical terms may influence the way in which we try to determine a single cause for autism, instead of seeing it as a multi-etiological phenomenon.

Recent years have witnessed an increasing interest in language as one of the most characteristic deficits in autism, although there is plenty of evidence that not every autistic individual shows deficits. Gillberg and Coleman (1992) criticised the handling of impairments in cognitive functions as a global phenomenon; hence, all cognitive abilities are thought to be impaired. For that reason, it is important to highlight that one has to distinguish between the cognitive profile of autistic individuals and children who suffer from other conditions (e.g. Down's syndrome, William's syndrome).

With regard to autism, verbal abilities are much more affected than performance skills and comprehension is less impaired than word production. In addition, measurements of rote memory skills are often above average. A number of affected individuals also display superior abilities in certain areas (“islets of special ability”) and frequently show superior rote memory functions (cf. Gillberg and Coleman 1992:167 ff.).

During the 1980s, not merely deficits in language and cognition, but also abnormalities in social and pragmatic skills were investigated. There are basically two seats of innovative theories that have emerged, namely, Hobson’s (1984) “affective theory” and Baron-Cohen’s (1988) “meta representation theory”. The former can be compared to Kanner’s and Piaget’s original descriptions. The latter reflects the capacity to infer other peoples’ mental states and is also known as “cognitive theory”. In fact, these theories are basically two of the main concepts in autism research (cf. Papadimitriou 1997:65 ff., Gillberg and Coleman 1992:169 ff.).

6. Language and Communication in Autism

6.1. Introduction

Since Kanner’s original description in 1943, autism was noticed as a problem of communication and useful language. In fact, Kanner viewed language deficits as central to the autistic syndrome and described the most prominent features within a case study of eleven children. Various researchers supported Kanner’s view and assumed deficits in language to be the very root of social interaction (cf. Kanner 1943, Schopler and Mesibov 1985:4 ff.).

It has to be mentioned though, that autistic individuals do not represent a homogenous group. Thus, universal claims about the linguistic competence of affected individuals cannot be made thoughtlessly.

In 1799, the French physician Marc-Gaspard Itard discovered the first case of an autistic child who became known as “Victor of Aveyron” (see Chapter 2). Alike Kanner, Itard supported the view of a language-based impairment and developed several methods of teaching communication (cf. Papadimitriou 1997:5 ff.).

During the 1950s and 1960s autism was noticed as an emotional problem rather than a language-based disorder; hence, language therapy was systematically avoided and replaced by psychological training. In his first descriptions, Kanner frequently referred to features such as echolalia, pronoun reversals, literalness and repetitions. Since research has focused on the language of autistic individuals, Kanner’s and Itard’s approach of a language-based

impairment was continued in the 1960s (cf. Kanner 1943, Fay and Schuler 1980, Schopler and Mesibov 1985).

However, the question remains, to what extent one can distinguish language and communication per se. Does an impairment of language necessarily imply a lack in the ability to communicate and vice versa?

On the one hand, certain language impairments (e.g. stuttering) can affect the communication between several speakers. The hearer himself feels distracted, which frequently results in impatience. On the other hand, an inability to communicate does not necessarily lead to linguistic impairments (cf. Büttner 1995:32).

This chapter shall explore the emergence of language and communication in autism and will further focus on children's linguistic skills. In order to realise the autistic child's manner of acquiring a language, one must comprehend this process in typically developing children. For that reason, current models of language development shall be discussed.

6.2. Theoretical background

In 1957, Burrhus Frederic Skinner and Noam Chomsky put the subject of child language development up for discussion. Supporting different points of view, two distinct schools of thought, namely "Behaviorism" and "Nativism" attracted a great deal of attention. On the one hand, Skinner followed the empiricist tradition, which suggested that assumptions and theories could only be verified or falsified after systematic observation. The instance of an event has to be documented efficiently and afterwards a theory can be formulated. Thus, the empiricist tradition views knowledge that derives from knowledge as variable, which can be measured. For that reason, Skinner perceived language as a simple and observable construct. On the other hand, Chomsky associated himself with the rationalist tradition, which assumed that theories and analyses were developed in the first place to test incoming information.

Developmental psychologist Jean Piaget combined both empiricist and rationalist aspects and suggested that knowledge could be perceived as the construct from our interaction with the environmental perceptible instances. Thus, we may be provided with a certain number of mental principles, which will be applied to incoming information. Either, perceived information may already be known or it may change the mental structure itself; hence, knowledge derives from the interaction between the mental structures and perceptible information (cf. Schopler and Mesibov 1985:17 ff.).

As regards the teaching of language and communication, professionals and therapists should be aware of the process of language development. It needs to be clarified in which manner language is acquired and which models of child language development describe not solely typical, but also deviant development of language.

6.2.1. Behaviorism

Indeed, Behaviorism emerged from the discipline of psychology during the late 1930s and assumed that solely observable behaviour could be investigated¹¹. Thus, mental states, introspective processes and unconscious behaviour were not taken into consideration. Observed incidences were described with respect to a stimulus, which appeared in the environment, and its response that came from the organism itself (cf. Skinner 1973:64-65, Snyder and Lindstedt 1985:18-19).

With regard to language acquisition and development, Skinner postulated that verbal forms of behaviour could be viewed as units that operate on the environment. These units are ‘learned’ by children due to environmental incidents, which reinforce them; hence,

“Language learning in children depends upon environmental events through the conditioning of their verbal operants with reinforcers.”

(Snyder and Lindstedt 1985:18).

According to Skinner, children’s verbal responses consist of small units, which turn synthetically into full phrases when the child learns to control the stimulus. Parents see themselves in the role of reinforcing operators and lead the child to the norm. Behaviorism suggests that children focus on the input information from their environment when acquiring a language (cf. Skinner 1973:66, Snyder and Lindstedt 1985:18 ff.)

6.2.2. Nativism

“To say that ‘language is not innate’ is to say that there is no difference between my granddaughter, a rock and a rabbit. In other words, if you take a rock, a rabbit and my granddaughter and put them in a community where people are talking English, they’ll learn all English. If people believe that, then they believe that language is not innate. If they believe that there is a difference between my granddaughter, a rabbit and a rock, then they believe that language is innate. So people who are proposing that there is

¹¹ In 1898, E.L. Thorndike investigated human behaviour and its possible modification. In fact, his attempt was one of the first who drew attention to the scientific community (Thorndike, E.L. 1898; cited by Skinner B.F. 1973:64).

something debatable about the assumption that language is innate are just confused. So deeply confused that there is no way of answering their arguments. There is no doubt that language is an innate faculty.”

(Chomsky, N. 2001:50-51).

In contrast to behaviourist thinking, the approach of Nativism suggested that language is an innate faculty. Thus, every human being is born with a set of mental principles, which endow it to acquire the syntactic structure of language.

Indeed, Noam Chomsky can be viewed as one of the most influential linguists of the second half of the twentieth century who made an effort to explain human language acquisition in the course of nativist tradition. Based upon the “Language Acquisition Device” (LAD), which illustrates a hypothetical brain mechanism, Chomsky assumed the capacity of language to be given from birth on. According to him, the LAD predisposes us to derive the syntactic structure and rules of our native language accurately from the impoverished input provided by adult language users. In other words, each infant is endowed with an amount of grammatical knowledge, which allows us to analyse incoming information by applying a set of mental principles to it. This knowledge does not refer to the grammar of a single language rather than including basic information about the structure of language per se. As these structures and mechanisms can be viewed as similar in all human beings, they seem to be universal.

Chomsky suggested that many aspects of language are universal and constrained by innate knowledge about language called “Universal Grammar”. In this context, he distinguished between “formal” and “substantive” universals. The former concept describes the rule system of a language whilst the latter includes basic information about its nature. In addition, each child receives linguistic input from the environment that predisposes it to hypothesise about the structure of language. According to Chomsky, the LAD endows the child to produce correct grammatical forms (cf. Chomsky 1972:27-30, Klann-Delius 2008:54-56).

Chomsky’s approach was criticised by Harald Clahsen in 1988. In particular, he challenged the fact that children are able to hypothesise about the grammatical structure of language so easily. According to him, each child has to ‘learn’ which of these structures are correct and does not choose between them randomly (Clahsen 1988; cited by Klann-Delius 2008:57).

However, it is quite questionable that children seem to know automatically the difference between correct and incorrect forms as this process would require a mechanism, which signals this kind of incorrectness. In addition, the LAD failed to explain the different developmental

periods during the process of language acquisition too; hence, the child does not merely receive correct forms from the linguistic input, but it has to pass different developmental periods in order to learn the correct structures.

Actually, Chomsky challenged his own assumption by proposing the ‘Principles and Parameters’ model (P&P model) in 1981. Based on the existence of a “Universal Grammar”, Chomsky specified his concept with some restrictions and claimed three features to be the very root of human language acquisition:

1. *Genetic endowment [...] which interprets part of the environment as linguistic experience [...].*
2. *Experience, which leads to variation, within a fairly narrow range [...].*
3. *Principles not specific to the faculty of language.*

(Chomsky 2005:6).

According to Chomsky (2005:7), just natural languages are defined by these principles and parameters. Thus, the young learner is merely confronted with grammatical forms of ‘existing’ languages and does therefore not produce incorrect forms.

In other words, the child aims to figure out the parameters and forms, which are relevant for his native language by scanning the input it gets from the environment. In doing so, the child automatically identifies the whole system of the parameters and develops a “core” grammar. Nonetheless, there are several linguistic features the child has to “learn” (e.g. idioms, irregular morphology etc.).

As regards the P&P model, grammatical knowledge is innate, but the young learner has to discover and identify parameters, which count for his native language. Alike the LAD model, the P&P model does not explain the different developmental periods of the process of language acquisition. Furthermore, discrepancies about an innate basis of language as well as the significance of the linguistic input are open for discussion (cf. Chomsky 1972, Zwart 1998, Klann-Delius 2008).

In fact, Chomsky’s concept of language can be viewed as central to the cognitive system. In this regard, he distinguished between the concepts of “competence” and “performance”. The former describes the knowledge of language whilst the latter refers to the actual use of it, which is very often ungrammatical (Chomsky 1965:4 ff.)

However, Chomsky viewed language as an abstract system, which can be explained by human behaviour and concentrated within his theories merely on the concept of competence and ignored what people actually say. In fact, he relied upon the speaker's intuitions as to what is correct or incorrect, but as we all know, not every person will make the same judgements concerning language. Furthermore, Chomsky said that

"A grammar of a language purports to be a description of the ideal speaker-hearer's intrinsic competence. If the grammar is, furthermore, perfectly explicit — in other words, if it does not rely on the intelligence of the understanding reader but rather provides an explicit analysis of his contribution — we may (somewhat redundantly) call it a generative grammar."

(Chomsky 1965:4).

With regard to the P&P model, Steven Pinker (1987) challenged Chomsky's assumptions and investigated furthermore, in which manner the child manages to identify the necessary parameters. In fact, the young learner is able to discover universal features via the X-bar scheme, but it also has to find out which of these segments is a noun, verb etc. (Pinker 1987; cited by Klann-Delius 2008:62 ff.).

In 1995, Chomsky discussed his modifications of the P&P model in the "Minimalist Program" (MP). Within his paper, the author minimalised the syntactic components and assumed that the universal grammar demonstrates a perfect design and that language faculty is based on a computational system, dealing with sound and meaning. This system includes two interface-levels, namely the Phonetic Form (PF) and the Logic Form (LF). Chomsky noted that the MP does not so much concentrate on these two interfaces, but on the computational system (Chomsky 1995; cited by Zwart 1998:15).

According to Fodor (1983) and Jackendoff (2000), language and cognition are supposed to be modular. Thus, language can be viewed as a unique and self-ruled module, independent from cognitive processes. In particular, syntactic knowledge is assumed to be innate and autonomic as it can not be explained by experience and learning. In order to prove these assumptions, language acquisition has been investigated in atypically developing children (Fodor 1983, Jackendoff 2000; cited by Klann-Delius 2008).

As will be discussed in the next chapter, children with autism are mostly impaired in their semantic-pragmatic abilities, but also morpho-syntactic skills seem to be affected. Furthermore, deficits in their social cognition become obvious and one may assume that language and cognition are impaired selectively.

6.2.3. Typical language development

In fact, language is specific to humans. We use spoken and written language everyday, which allows us to communicate and establish social relationships with other peers. Equipped with a vocabulary of some 50,000 to 100,000 terms and the ability to use them in different manners, language can also be perceived as a very complex construct. Indeed, we do not think consciously about the purpose of language as its existence and usage seems quite natural to us. Nonetheless, infants are not born with this tool. They have to master different periods and levels in order to interact appropriately with their environment.

One may imagine that the process of language acquisition challenges the child in different manners as it must be quite complicated to acquire a concept of language as well as different linguistic skills so fast. In fact, this is not the case as children acquire language unconsciously. In other words, they do not reflect about language and learn grammatical features by heart, but get linguistic input from their environment. Thus, they use the input they receive in order to make experiences and getting feedback from their environment. With regard to this, one may come to the conclusion that children must have a certain knowledge about language from birth on if they manage to master this process in such a short time. Although current psycholinguistic approaches criticise the existence of an innate basis for language, they stress the importance of linguistic input. Thus, we would not be able to acquire language without any receipt of linguistic data. In addition, psycholinguistic research also focuses on the process of language acquisition and not just on the product (cf. Clark 2003:1-3).

6.2.4. Language Acquisition

Paul (1987:61) assumed that typically developing children do not utter their first words until the second year of life, although they are able to express their communicative intents by the age of one year. Much research has been done in this area and it became evident that individuals produce their first words at the age of one year or later (cf. Clark 2003, Ehlich, Bredel and Reich 2008, Klann-Delius 2008).

During the first three weeks of life, the infant expresses its communicative intents by screaming, which serves not only as a communicative tool, but represents also the vital needs. After two weeks, one may also recognise a certain sound pattern, followed by the appearance

of modulation and melody, and the first attempt to produce vowels (three to four months of age). (cf. Klann-Delius 2008:24).

By the age of seven months, infants initiate to babble and start to produce their first consonants, combined with vowels. In addition, the infant's vocal tract becomes similar to that of an adult speaker. First words become apparent by the age of twelve months or later. According to Locke (1995), they can be viewed as "*prephonological*", as they consist merely of consonant-vowel (CV) or consonant-vowel-consonant (CVC) syllables (Locke 1995; cited by Klann-Delius 2008:25.).

Within the period of eighteen to twenty-four months, the lexicon consists of approximately 50 words, but shortly after, the vocabulary increases (*vocabulary spurt*) and the child is endowed with an active lexicon of 100 words. However, according to Tomasello (2003:50), this increase is not easy to assess.

As regards the first production of words, much debate has been going on. According to Bühler (1928), children utter their first words by the age of ten months whilst Bates et al. (1992) assumed word production to initiate by the age of eleven to thirteen months. Nonetheless, current research assumes this to happen around the twelfth month of age (Bühler 1928, Bates et al. 1992; cited by Klann-Delius 2008:38).

At the same time, the sound system evolves and the acquisition of grammatical categories initiates. Thus the phonological system consists:

"[...] to the entire set of phonological contrasts that occur in the target language. Like the morphological elements that make up a grammar, a phonology can now be described in terms of operations or rules for combining phonemic and allophonic segments."

(Bates and Snyder 1987; cited by Klann-Delius 2008:26)

As mentioned previously, children initiate to utter their first words by the age of ten to twelve months. During this period (one-element period), they mostly use single words, but also negotiation and question marks are evident. (cf. Klann-Delius 2008:41 ff.).

The second-element period takes place between the eighteenth and the 24th month of life. Children produce a few plurals and there is no unique pattern concerning the order of words. Bloom et al. (1975) and Brown (1973) investigated children's different stages of language acquisition and found out that the major part of tested children, independent of origin and culture, used the same semantic pattern. Furthermore, children in this developmental stage master to identify the subject and the predicate in basic sentences.

The last period concerning syntactic development is called third- and multi-word period. The child makes an effort to produce phrases, which are syntactically more complex and also attempts include complex grammatical forms. Thus, children adapt their syntactic knowledge to the language spoken in their environment (Bloom et al. 1975, Brown 1973; cited by Klann-Delius 2008:41-43).

Furthermore, overgeneralisations such as “goed” or “mouses” frequently appear and demonstrate the child’s active role within this developmental process. Grammatical structures become more complex and utterance length increases. Sentence content becomes more ambitious and does not refer to events anymore, which are immediately present; hence, the aspects of space and time get expanded and new context information is added (Paul 1987:62).

With regard to word comprehension, it has to be highlighted that already the neonate is able to distinguish linguistic and non-linguistic sounds from each other. Furthermore, there seems to be a preference for the maternal voice and also prosodic elements of the native language can be differentiated from other languages. Alike the adult speaker, children’s perception is categorical, which means that they go by phonetic contrasts when distinguishing different sounds (cf. Klann-Delius 2008:28).

Comprehension can not be compared to production with respect to developmental age. Indeed, children understand many words before they can actually produce them. Word comprehension becomes apparent by the age of ten months. Thus, children recognise words, which they have already used during peer-play and associate them with routines. Later, the first conventional use of language becomes obvious as children seem to develop lexical comprehension and do not respond to the context of routine games anymore

During this period, both receptive and expressive use of vocabulary as well as the social use of language proceeds (e.g. greetings). Comprehension cannot be compared to production with respect to developmental age. Indeed, children understand many words before they can actually produce them (cf. Paul 1987:62-63).

As mentioned previously, children express their communicative needs before they can actually speak. Within the first two years of life, the child basically communicates inside of the familiar environment (parents, siblings etc.). They support the child in order to express their communicative intents (e.g. child-directed speech). By the age of three, children do not need this kind of support anymore as they communicate with other peers. Later, the child realises that the peer’s mental condition and knowledge differs from its own status (Theory of Mind). Children initiate to produce narrations and expand their linguistic and pragmatic skills

as they interact with a large number of peers. Discursive abilities include skills such as narration and communicative cooperation. Alike pragmatic development, this period happens to develop in the familiar environment. When communicating with other peers, the social role-play demonstrates an important stage as the child gets used to routines, turn-taking etc (Trautmann and Reich 2008:41-42).

In sum, it becomes obvious that languages has also strong social component. Indeed, it is not enough to investigate only the child's linguistic skills in order to give a statement about its developmental process.

6.3. Language development in autism and Asperger's syndrome

6.3.1. Early communication

In contrast to Asperger's syndrome, it has been frequently suggested that language development in autism is characterised by a deviant pattern. Although early research has supported the view that autistic individuals 'refuse' to communicate and instead, stay mute, various theories rejected this assumption. Actually, affected individuals do not fail to communicate rather than communicating differently than typically developing children (cf. Paul 1987:64; Papadimitriou 1997:96).

Indeed, individuals with Asperger's syndrome are not supposed to show a deviant pattern in their language development. Moreover, they start to produce their first words very early and their language is characterised by a colourful expression (cf. Remschmidt 2008:48).

However, it is of common interest to discover if deviant patterns in autism emerge before or after the onset of speech. During this period, typically developing children express their needs and intentions by the use of nonverbal communication. What do we expect from autistic individuals?

As mentioned previously, affected individuals do not express their communicative intentions by using gestures. Nonetheless, they are able to communicate successfully, even if the range of their communicative expressions is narrower than in typically developing children. Thus, affected children rarely use preverbal communication (e.g. gaze, vocalisation, etc.) rather than showing other forms of behaviour (e.g. aggression) to deliver their message. It is important to highlight that young autistics that develop speech differ significantly from those who remain mute. Although speaking autistics demonstrate a narrower range of communicative behaviour, this may not be the case for mute ones (cf. Paul 1987:64-65).

With regard to Asperger's syndrome, children express their communicative intents very early. In contrast to individuals with autism, children with Asperger's syndrome show other deficits with respect to their communicative development. Although they develop language very early, they are not able to adapt themselves to their interlocutor and frequently soliloquise (cf. Remschmidt 2008:49).

In sum, it became evident that the development of preverbal communication in autism follows a deviant pattern. In contrast, individuals with Asperger's syndrome do not show this kind of feature. Even if those individuals who develop speech seem to present a wider spectrum than mute autistics, communicative behaviour remains limited.

6.3.2. Mutism

Whereas some autistic individuals develop speech, a sizable proportion of them do not. In 1980, various studies reported a rate of muteness, which varied from 28% to 61%. It has to be mentioned though, that not solely diagnostic criteria, but also the definition of muteness has changed over the years. Thus, no current data are available yet. Furthermore, autistic individuals who remain mute are frequently suspected of being deaf. Various diagnostic checklists assess muteness as one of the major features of affected children. Actually, literature frequently reports a muteness-rate of over 50% (cf. Fay 1980:22, Büttner 1995:53). In contrast, individuals with Asperger's syndrome do not show this feature within their language development (cf. Remschmidt 2008:49).

Thus far, one may assume that muteness in autistic infants appears due to hearing impairments, but this is not necessarily the case. Literature frequently tends to use the term 'mute' in order to describe autistic infants who do not develop speech. German-speaking literature defines mute individuals as somewhat unable to speak, although this condition is not consistent with a clear defined clinical picture. Therefore, it would be more appropriate to use the term 'non-speaking' when referring to autistic individuals as we do not know for sure what exactly causes this condition (cf. Büttner 1995:54 ff.).

It becomes obvious that individuals with autism and Asperger's syndrome do not feel the need to interact with their social environment. The insufficient use of language in autism may be caused by a kind of fear to failure and further, by not-knowing that language serves to communicate.

6.3.3. Preverbal communication

Indeed, a delay in language acquisition seems to be a common feature in autism. During the preverbal period, parents frequently notice atypical babbling and screaming. Babbling, which can be defined as the combination of sounds (vowels and consonants), seems to deviate from typical developmental patterns. Whilst typically developing children imitate their peer's babbling, autistic infants seem to reproduce their own sounds. Although there is evidence that some autistics develop babbling at the same time as their typically developing peers, retrospective research has noticed that the major part of affected individuals develops babbling by the age of three to five years (cf. Blanken et al. 1993:812, Papadimitriou 1997:98 ff.).

Another common feature is atypical early vocalisation. According to Sheinkopf et al. (2000:350), affected children did not have difficulties with well-formed syllables, but their vocalisations were incomplete (e.g. phonation).

Individuals with Asperger's syndrome exhibit abnormalities in their speaking voice (cf. Remschmidt 2008:49). Papadimitriou (1997:16) described their speech as monotone and also their intonation and prosody differs from that of typically developing children.

6.3.4. Echolalia

6.3.4.1. Typical Echolalia

"One day the youth (Narcissus), being separated from his companions, shouted aloud, "Who's here?" Echo replied, "Here," Narcissus looks around, but seeing no one called out, "Come." Echo answered, "Come." As no one came, Narcissus called again, "Why do you shun me?" Echo asked the same question. "Let us join one another," said the youth. The maid answered with all her heart in the same words, and hastened to the spot, ready to throw her arms about his neck. He started back "Hands off! I would rather die than you should have me!" "Have me," she said; but it was all in vain."

(Bulfinch 1947; cited by Fay 1980:25).

According to the myth, Echo was punished by the Greek goddess Juno for always having the last word. Therefore, she would never be allowed again to speak the first word, but should still have the last one. However, Narcissus could not differentiate himself from others whilst Echo did not differentiate whether words belong to her or not. Various psychoanalysts hypothesised that individuals who suffer from schizophrenia would present not solely Narcissus' behaviour, but also that of Echo.

The term “echolalia” can be defined as the parrot-like repetition of words just uttered by another person. In fact, not solely autistic individuals, but also typically developing children show echoic behaviour within a certain developmental period. It seems that echolalia becomes apparent by the age of 14 months due to articulation exercises; hence, the child’s utterances assume an imitative character and are probably produced without any communicative intent. Actually, this process can be defined as “mechanical repetition” (cf. Fay 1980:27).

As regards the function of echolalia, different aspects have been discussed. Do children produce echolalia as a form of interactive communication or do they just repeat mechanically what has been said to them?

Two different theories of language acquisition can be distinguished: either, children acquire language analytically or they use a so-called “Gestalt” processing style. The former describes language acquisition as a period in which children acquire linguistic rules step by step. Thus, they start to produce one-word sentences, continue to utter multi word sentences until they figure out productive linguistic rules. In contrast, ‘Gestalt’ processing means that children produce utterances, which are stored as single units or chunks; hence, the internal structure has not been analysed yet (cf. Papadimitriou 1997:10-102).

In comparison, Tomasello (2003) claims that language acquisition can be explained by a group of theories, named “usage-based” theories. This approach suggests that *[...] the essence of language is its symbolic dimension, with grammar being derivative.*” (Tomasello 2003:5).

Grammar is represented by a set of different processes, which can be named “grammaticalization”. In fact, usage-based theorists assume that human individuals link various symbols when communication with each other. These symbols evolve into patterns and grammatical rules (e.g. passive, -ed past tense etc.).

In contrast to the nativistic view, linguistic rules are perceived as symbols that have a meaning and are used in daily communication. According to Tomasello (2003), competence of our native language is represented by various structures, which include not only grammatical rules, but also individual expressions (e.g. idioms, metaphors etc.). Thus, competent speakers have to master not just complex syntax, but also the individual meaning of words.

“In addition, and importantly, they also control many so-called mixed constructions that fall somewhere in between these in having both concrete and abstract elements [...]”.

(Tomasello 2003:6).

From this it follows that children might not distinguish between “rule-based” and “item-based” constructions when acquiring a language as there is no boundary amongst them. Furthermore, it is suggested that the language of children consist for the most part of item-based constructions. Nonetheless, they master to produce abstract constructions in the course of one acquisition process. Tomasello (2003) justifies this view by stating that the cognitive and social equipment of young learners is more significant than previously assumed (cf. Tomasello 2003: 5-7.).

6.4.4.2 Autistic Echolalia

Echolalia can be viewed as one of the most prominent features in the speech of autistic individuals and appears either immediately or delayed. Thus, utterances will be repeated immediately after they have been heard or even days and weeks later (cf. Blanken 1993:812).

In 1989, Szatmari et al. compared a group of children with Asperger’s syndrome with high-functioning individuals and found out that the autistic group showed a higher frequency of echoic utterances (Szatmari et al. 1989:710). Furthermore, Remschmidt (2008:49) argues that the feature of echolalia seems to be absent in Asperger’s syndrome.

In 1981, Prizant and Duchan reported six communicative functions, which included:

‘turn-taking, assertions, affirmative answers, requests, rehearsal to aid processing, and self-regulation’

(Prizant and Duchant 1981; cited by Paul 1987:67)

Furthermore, Prizant (1983) noticed that autistic individuals expressed their communicative intent by producing routine utterances. Even if children tend to repeat the same over and over again, one can observe that these utterances have a relation to the child’s social context (Prizant 1983; cited by Büttner 1995:42).

It seems that children with autism and Asperger’s syndrome rely on a “Gestalt” style when acquiring language. Thus, they repeat single chunks or multiword utterances and decompose them into meaningful segments. Even if the autistic child’s use of language is limited, this does not necessarily imply a lack of communicative intent (cf. Papadimitriou 1997:102).

Indeed, echoic utterances may support the child to make conversation (e.g. routine questions at the beginning of a conversation). Furthermore, even a lack of linguistic rules and structures does not prevent the child from active communication (cf. Büttner 1995:42 ff.).

However, it is a matter of common knowledge that language ability in autism and Asperger’s syndrome is problematic to diagnose. Literature has frequently noticed that impaired language

skills were one of the most prominent characteristics in autism. In particular, echolalia was assumed to emerge due to deficits in language processing. However, the ability to utter echoic fragments requires a certain expertise to process not solely prosodic, but also phonological aspects of speech. Furthermore, one must be capable of suppressing eventual environmental noises and concentrate on speech. If autistic individuals are supposed to show significant impairments in language, how do they master this complex process?

6.3.5. Pronominal reversal

In fact, pronominal reversal (I versus you) was assumed to be the consequence of identification problems. During the 1960s, Bettelheim suggested that young autistics suffered from confusion of their personal identification and said that

“it is not easy to talk constantly in opposites to do quite well in getting across what is wanted, and never make the ‘mistake’ of using pronouns correctly.”

(Bettelheim 1967; cited by Fay 1980:64)

The term “pronominal reversal” is widely accepted by the current scientific research community and seeks to describe affected people’s behaviour. It has to be mentioned though, that autistic individuals tend to exchange pronouns rather than to reverse them (cf. Büttner 1995:48). In addition, child psychologists assumed that pronouns may be a prerequisite for the development of self-awareness (cf. Fay 1980:65).

However, how does a child master to shift reference in order to use pronouns appropriately? Eve Clark (1977) explained this phenomenon with her “dual-hypothesis” approach. According to her, children initially use forms such as “I, me, my or mine” as the first personal pronoun to refer to themselves or their own name. Then, they continue to use the pronoun “you” (cf. Fay 1980:67).

Indeed, pronominal reversal does not seem to be a characteristic feature in individuals with Asperger’s syndrome. Szatmari et al. (1989:220 ff.) noticed that individuals with high-functioning autism produced more reversed pronouns than children with Asperger’s syndrome.

In fact, a lack in comprehending the aspects of time and space may be another reason why young autistics ‘reverse’ pronouns. Thus, they obviously fail to decode linguistic structures,

which are related to spatial and temporal positions of the speaker. Pronouns can be defined as deictic structures whose meaning depends upon a context. In particular, an exact interpretation of the pronouns “I” and “you” requires the ability to put oneself in the position of the speaker. One has to be aware of certain ‘rules’ and be able to interpret any change in the speaker’s spatial and temporal position (cf. Büttner 1995:50).

6.4. Language comprehension and production

In the past few years, literature has demonstrated that individuals with autism showed poorer results in standardised tests of language comprehension than individuals who suffered from other conditions. In 1981, Tager-Flusberg investigated language abilities in autistic children and focused on sentence comprehension. The author noticed that the autistic group performed more poorly in comprehension tasks than controls. Furthermore, Tager-Flusberg concluded that autistic individuals showed deficits in their semantic knowledge (Tager-Flusberg 1981:49 ff.).

Noterdaeme et al. (2009:476 ff.) investigated a group of children with Asperger’s syndrome and high-functioning autism. The authors found out that high-functioning individuals performed worse in tasks of expressive and receptive language. Individuals with Asperger’s syndrome did not show difficulties in tests of expressive language, but 30% of them performed poorly in tasks of receptive language.

In 1985, Paul and Cohen focused on children’s ability to cope with indirect requests for action (e.g. “Can you colour this circle blue?”). The authors demonstrated that both autistic children and controls showed similar results when the intent of the request was made explicit. In contrast, affected individuals performed badly when the same task was presented to them within an unstructured context (Paul and Cohen 1985; cited by Paul 1987:71).

Thus, individuals with autism seem to be impaired in figuring out the speaker’s intention without an explicit context. In fact, a number of autistic individuals tend to avoid participation in communicative activities, although the intention to communicate is given. The question remains, whether linguistic deficits or an inappropriate use of language could be responsible for that.

One of the core deficits in the language of autistic individuals and those with Asperger’s syndrome concerns the area of pragmatics. Current literature highlights the fact that speaking autistics demonstrate a lack of spontaneous speech and limited verbal expression. According

to Baltaxe (1977), affected individuals show deficits in the ability to follow certain conversational rules (e.g. politeness) and are further not able to distinguish given from new information (Baltaxe 1977; cited by Paul 1987:72-73).

6.5. Linguistic abilities

6.5.1. Introduction

In fact, language provides every human being with a vast area of linguistic abilities, including phonology, syntax, semantics etc. All these abilities allow to handle speech sounds, judge if an utterance is grammatically correct or not and empower us to figure out the grammatical and pragmatic meaning of a sentence. These skills have been investigated in autistic children, specifically the aspects of phonology, syntax, semantics and pragmatics. By now, only a few studies concerning linguistic abilities in individuals with Asperger's syndrome have been published.

Actually, there is general agreement that deficits in the area of pragmatics seem to be universal in autism. Whereas affected individuals frequently perform very well in syntactic or semantic tasks, the level of pragmatic ability will be lower. As regards individuals with Asperger's syndrome, they seem to perform quite well in the areas of syntax and morphology, but show deficits in neuropsychological abilities such as executive functions and weak central coherence.

Even if one can judge the extent of language impairment in autism, there still remain those individuals who shall never develop speech. Mute autistics may or may not present any deficit in the areas of phonology, syntax or semantics, but it is though very difficult to evaluate their linguistic skills. In addition, it is problematic to judge if a specific linguistic problem rather than a failure to communicate may cause a delay in language acquisition.

6.5.2. Phonology

In comparison to typically developing children, autistics do not differ significantly in the quantity of their phoneme inventory. Blanken et al. (1993) suggested that affected individuals use

“[...] foreshortened phrases in an effort to terminate the communication as quickly as possible.”

(Blanken 1993:813)

As regards prosodic development, deficits are present. The ability to use prosodic forms appropriately is related to other linguistic areas such as semantics, syntax and pragmatics, which provide us with necessary information to interpret speech signals (cf. Papadimitriou 1997:106-107).

However, Paccia and Curcio (1982) argued that children who were able to repeat exact prosodic features of their own speech may suffer from linguistic impairments as the manipulation of prosody always indicates some degree of comprehension (Paccia and Curcio 1982; cited by Blanken 1993:814).

In 2008, Saalasti et al. investigated a group of 22 individuals with Asperger's syndrome and compared them to typically developing children. Among others, affected individuals had to accomplish several tasks, including a test of "Phonological Processing". To sum up, individuals with Asperger's syndrome performed worse in the areas of receptive language and phonological processing, but no significant differences were detected (Saalasti et al. 2008:1574 ff.).

6.5.3. Syntax

More has been written on syntactic abilities in autism. According to Tager-Flusberg (1981:52 ff.), autistics basically tend to use infinitives and avoid the use of tenses. Two-word utterances frequently appear and propositions do not seem to have any meaning. In fact, the frequent use of two-word utterances can also be observed in the acquisition of language in typically developing children. In contrast to young autistics, they succeed to master the next and more complex level. The author reported that autistic children performed more poorly in tasks of sentence comprehension, but were able to 'use' rules in order to figure out complex linguistic structures.

With regard to Asperger's syndrome, affected individuals are supposed to perform better than children with autism (cf. Remschmidt 2008:49). Ghazziudin et al. (2000:67 ff.) investigated syntactic abilities in 15 individuals with Asperger's syndrome and 13 children with high-functioning autism. It became evident that children with Asperger's syndrome performed on average better and were more likely to use complex syntax. Nonetheless, it is difficult to make a general conclusion about the syntactic abilities of affected individuals as there are not enough data available.

6.5.4. Morphology

As mentioned previously, autistic children are supposed to master language development by applying memorised knowledge instead of rules. In 1980, Bartolucci, Pierce and Streiner investigated morphological skills in autistics and typically developing children and reported further deficits in the correct use of verb suffixes. The authors concluded that affected individuals did not fail in the ability to use relevant morphemes grammatically correct rather than figuring out the actual meaning. According to Bartolucci et al., deficits in semantic decoding may be responsible for this (Bartolucci, Pierce and Streiner 1980:45 ff.).

Ghazziudin et al. (2000:68) noticed that morphological skills in Asperger's syndrome were on average better than in children with high-functioning autism.

6.5.5. Semantics

Hermelin and O'Connor (1970) examined a group of children with autism and a control group in order to test semantic knowledge. In contrast to the control group, autistic individuals failed to recognise semantic relations between words. The authors suggested that autistic children did not focus on semantic relations rather than concentrating on the sequence of words (Hermelin and O'Connor 1970; cited by Papadimitriou 1997:116-117).

In addition, autistics fail to figure out the actual meaning in a literal context. Therefore, deficits in the area of semantics may appear due to an inability to use linguistic information effectively in order to recall memorised information. In fact, pronouns, prepositions and deictic expressions signalise the main issues when investigating the autistic child's lexicon. Therefore, it is still a matter of discussion what may cause the deficits in the area of semantics (cf. Papadimitriou 1997:118).

6.5.6 Pragmatics and discourse abilities

Indeed, one of the major deficits in autism spectrum disorders is a qualitative impairment in communication. As previously discussed, these deficits can range from mutism and a deviant language pattern to almost typical language skills with poor conversational performance. Investigations of language in autism have specifically focused on high-level discourse and pragmatic abilities. Individuals with autism are more likely to show characteristic features such as mutism, echolalia and the production of nonsense words whilst an inappropriate and

loud speech volume was noticed in children with Asperger's syndrome. In fact, pragmatic skills endow us with the ability to communicate appropriately with our environment. Deficits in high-level discourse aspects such as turn-taking, metaphors, literalness have been reported not only in autism, but also in Asperger's syndrome. Furthermore, difficulty with organising narratives became evident too (cf. Eigsti et al. 2006:1007-1008).

In 2006, Eigsti et al. investigated syntactic and higher-level discourse abilities in a group of children with autism and compared them to a developmentally delayed and a control group. To sum up, the authors identified syntactic deficits in the autistic group; hence, their language was less complex. Surprisingly, affected individuals produced the same amount of different word types as their typically developing peers. Furthermore, their receptive language was not as bad as previously believed. Autistic children did produce more jargon and nonsense words than the developmentally delayed and control group. According to the authors, this increased amount of jargon and nonsense words may explain the less complex syntax in autism. Furthermore, they suggest that

"Children are increasingly likely to talk about things that are spatially and temporally removed as they grow in language skill and cognitive skill."

(Eigsti et al. 2006:1019)

With regard to discourse abilities, the authors found out that autistic children produced the same amount of turns as typically developing children and were also able to introduce new topics. Nonetheless, affected children produced more utterances that were not relevant to the discourse situation (Eigsti et al. 2006:1019 ff.).

In addition, de Villiers et al. (2007:315) investigated pragmatic abilities in a group of individuals with autism and Asperger's syndrome and found out that affected individuals performed quite successfully, although they showed deficits in the aspects of metaphors, irony and conversational implicature.

At first sight, it seems that individuals with autism and Asperger's syndrome perform quite comparable to typically developing children. However, on closer look, deficits become obvious. In particular, the ability to communicate successfully and discourse skills seem to be impaired.

7. Asperger's syndrome

7.1. Introduction

“Jeder Mensch ist ein einmaliges, unwiederholbares, unteilbares Wesen („Individuum“), darum auch letztlich unvergleichbar mit anderen. In jedem Charakter finden sich einander scheinbar widersprechende Züge – gerade aus Gegensätzen und Spannungen lebt ja das Leben.“

(Asperger 1944:1)

In 1943, the Austrian paediatrician Hans Asperger brought his ideas and observations to the German-speaking world and published his doctoral thesis “‘Autistic psychopathy’ in childhood” in 1944 (cf. Lyons and Fitzgerald 2007:2022).

In fact, current research still attempts to comprehend the nature of autism spectrum disorders per se. Although overwhelming progress has been made in distinguishing the different syndromes, adequate diagnosis is still problematic. Although Asperger's work was appreciated by the main part of autism research, it is still a matter for discussion as to whether Asperger's syndrome and autism differ significantly from each other.

This chapter shall mainly focus on aetiology and diagnosis. Furthermore, symptomatological differences of Asperger's syndrome and infantile autism will be discussed.

7.2. Historical background

Both Leo Kanner and Hans Asperger adapted the term “autistic”, originally introduced by the Swiss psychiatrist Eugen Bleuler, to describe the characteristic features of autistic individuals. In fact, Leo Kanner has always been viewed as one of the main pioneers in autism research whereas Asperger's work was acknowledged by the international research community somewhat later. Attention within the English-speaking scientific community was soon gained

thanks to Lorna Wing (1981), who published Asperger's writings in an English-language journal.

It has often been argued that Kanner and Asperger may not have been aware of each other's work. Actually, Hans Asperger presented his ideas for the first time during a lecture entitled "Das psychisch abnormale Kind" at the Viennese University Hospital in 1938. In the very same year, this lecture was published in the Viennese magazine "Wiener Klinische Wochenschrift". Kanner might have been influenced by Asperger's ideas, but there is no sufficient proof for this assumption. Surprisingly, both Kanner and Asperger never met in person (cf. Bleuler 1911, Kanner 1943, Asperger 1944, Lyons and Fitzgerald 2007:2022, 2023).

7.3. Clinical picture and diagnosis

7.3.1. Symptoms

With regard to language development and cognitive abilities in Asperger's syndrome, no significant delay is obvious. In contrast to individuals with infantile autism, children with Asperger's syndrome master the process of language acquisition quite successfully. Affected individuals are frequently noticed as eloquent speakers and their IQ either conforms to the norm, or is much higher than in the typically developing population. Social impairments in early childhood are barely noticed as children's social relationships with other peers seem to work out.

Nonetheless, social difficulties become obvious during education, because this situation presents a change in the children's routines. They have to adapt themselves to a multitude of norms and rules and are further supposed to establish relationships with other peers (cf. Remschmidt 2008:48 ff.). Whether children with Asperger's syndrome acquire language in a different manner than typically developing children has always been a matter of discussion. However, affected individuals frequently show typical or even early language development and their speech is characterised by an extraordinary vocabulary (cf. Remschmidt 2008:48 ff.).

In contrast, Gillberg and Coleman (1992:43) reported some cases that presented deviant language development, followed by the emergence of excellent language skills.

To sum up, language development in Asperger's syndrome may be perceived as typical when compared with the average population, but on closer analysis, deficits may appear.

As regards communicative abilities, individuals with Asperger's syndrome do not show the same deviant pattern when compared to children with infantile autism (e.g. echolalia, pronoun reversal etc.). In fact, they do not adapt themselves to their interlocutor and frequently soliloquise, which makes successful communication difficult. In addition, affected individuals show deficits with respect to their prosodic features (monotonous speech and intonation).

Various researchers reported impairments in motor skills and noticed that children with Asperger's syndrome frequently suffered from dyspraxia. Thus, they failed to execute already planned actions (see Chapter 3). In addition, their emotional behaviour differed qualitatively from that of individuals with infantile autism. On the one hand, people with Asperger's syndrome do not seem to have any sense of humour and often react aggressively upon their environment. On the other hand, they are perceived as sensitive and compassionate (cf. Remschmidt 2008:50).

It has to be mentioned though that many people with Asperger's syndrome never come to the attention of clinicians (e.g. psychiatrists, psychologists etc.) as their outcome is very variable. As mentioned previously, affected individuals are often perceived as peculiar and stubborn, but they do not show any psychiatric 'abnormalities'. For that reason, a high percentage of them are misdiagnosed. As their development of language proceeds at a fairly normal rate and their socio-communicative abilities do not diverge from the norm, many of them seek psychiatric help for the first time solely in adulthood (cf. Gillberg and Coleman 1992:49 ff.).

The current version of ICD-10 (2007) characterises Asperger's syndrome as follows:

"F84.5 Asperger's syndrome

A disorder of uncertain nosological validity, characterized by the same type of qualitative abnormalities of reciprocal social interaction that typify autism, together with a restricted, stereotyped, repetitive repertoire of interests and activities. It differs from autism primarily in the fact that there is no general delay or retardation in language or in cognitive development. This disorder is often associated with marked clumsiness. There is a strong tendency for the abnormalities to persist into adolescence and adult life. Psychotic episodes occasionally occur in early adult life."

(ICD-10 (2007), 10th revision; <http://apps.who.int/classifications/apps/icd/icd10online/>)

ICD-10 remarks that these two conditions differ solely in their course of language development, but present similar behaviour. Thus, when comparing children with autism to individuals who suffer from Asperger's syndrome, both of them may demonstrate the same repertoire of behaviour, but their symptoms may be manifested differently. Therefore, a dimensional rather than a categorical perspective would help to understand the distinction.

In fact, a clear-cut distinction between these two syndromes is a delicate issue as Asperger did not lay down any diagnostic criteria within his descriptions (cf. Leekam et al. 2000:12).

Various researchers have argued that solely the assessment of IQ alone could indicate the type of syndrome the person suffers from. Consequently, IQ of individuals with Kanner autism tends to be low whereas Asperger's syndrome is characterised by a much higher result (cf. Gillberg and Coleman 1992:43).

Since autistic individuals do not represent a homogenous group, it is unfair to use just IQ measurement in order to establish a differential diagnosis of both syndromes. For example, a child may show autistic-type cognitive deficits, but simultaneously present excellent language skills. Furthermore, there are a certain number of individuals that present a milder form on the autistic spectrum and are frequently misdiagnosed. For this reason, clinical practice should also endeavour to differentiate the autistic syndromes from other psychiatric conditions.

7.3.2. Diagnostic criteria

This section shall give an overview of current diagnostic criteria that have been suggested by scientific research communities. As mentioned previously, Asperger described his syndrome in vivid detail, but did not suggest any diagnostic criteria. Based upon his original writings, several authors have defined specific criteria in order to distinguish Asperger's syndrome from other developmental disorders (Leekam et al. 2000:12).

Gillberg and Coleman (1992) stated six criteria that must be met for diagnosis:

1. "Severe impairment in reciprocal social interaction"
(at least two of the following)

- (a) inability to interact with peers
- (b) lack of desire to interact with peers
- (c) lack of appreciation of social cues
- (d) socially and emotionally inappropriate behaviour

2. All-absorbing narrow interest
(at least one of the following)

- (a) exclusion of other activities
- (b) repetitive adherence
- (c) more rote than meaning

3. Imposition of routines and interests
(at least one of the following)

- (a) on self, in aspects of life
- (b) on others

4. *Speech and language problems*
(at least three of the following)

- (a) *delayed development*
- (b) *superficially perfect expressive language*
- (c) *formal, pedantic language*
- (d) *odd prosody, peculiar voice characteristics*
- (e) *impairment of comprehension including misinterpretations of literal/implied meanings*

5. *Non-verbal communication problems*
(at least one of the following)

- (a) *limited use of gestures*
- (b) *clumsy/gauche body language*
- (c) *limited facial expression*
- (d) *inappropriate expression*
- (e) *peculiar, stiff gaze*

6. *Motor clumsiness: poor performance on neurodevelopmental examination*

(Gillberg and Coleman 1992:44)

On closer analysis it becomes apparent that Gillberg's diagnostic criteria for Asperger's syndrome and infantile autism share similar features. As mentioned previously, individuals with Asperger's syndrome do not seem to present any delay¹² in their development of language. Nonetheless, Gillberg quotes deviant language development as a necessary criterion for diagnosis. Concerning this, it ought to be emphasised that clinicians should integrate an appropriate assessment of language skills within their diagnostic sessions.

In contrast to Gillberg and Coleman (1992), ICD-10 (World Health Organisation 1993) specified

"a lack of any clinically significant general delay in spoken or receptive language or cognitive development"

(The ICD-10 Classification of Mental and Behavioural Disorders 1993:186,
<http://www.who.int/classifications/icd/en/GRNBOOK>)

Asperger (1944) described not only the children's lexicon, but also features of intonation, speech etc (cf. Asperger 1944, Leekam et al. 2000:12).

Hans Asperger characterised his syndrome as follows:

¹² *"The definition of what counts as language delay is quite clear-cut. If the child is not producing single words by the age of 2, or phrase speech by the age of 3, then they are defined as delayed in language."* (Baron-Cohen 2008:13).

- *No language delay*
- *Pedantic style of speech*
- *Precocious vocabulary development*
- *Narrow interests (e.g. flags of the world, weather maps, the history of the railways, etc.)*
- *A preference for adult company over that of a peer group*
- *Bossy and controlling*
- *Social oddities that might appear either as social withdrawal or as social intrusiveness*
- *A desire for things to be done in the same way over and over again*
- *An excellent attention to and memory for detail*
- *An IQ in average range, or above*

(Asperger 1944; cited by Baron-Cohen 2008:22)

Nevertheless, the fact that these criteria may also be used to describe other autism spectrum conditions ought to be stressed. Individuals with Asperger's syndrome are often misdiagnosed as they frequently do not meet these criteria or show milder forms.

7.4. Subgroups

Since one is aware of the existence of several conditions that differ from 'typical' Asperger's syndrome, differential diagnosis can be quite problematic.

7.4.1. Tourette's syndrome

In 1885, the French physician Georges Gilles de la Tourette described a few children who suffered from involuntary movements and sounds, commonly known as tics. Even though Tourette's syndrome is characterised by features that are typical for other conditions, it was officially accepted as a spectrum disorder by ICD-10 (1993). Furthermore, it was suggested that people with Asperger's syndrome frequently present features, which have been reported in children with Tourette's syndrome (cf. Remschmidt 2008:54).

7.4.2. Schizophrenia

Since Kanner's and Asperger's writings (1943, 1944), a symptomatological relation between schizophrenia and autism has always been a matter of discussion. In fact, both conditions differ not only in symptomatology, but also in course, age of onset, cognitive functioning, family history etc. Nonetheless, research still attempts to discover overlaps between schizophrenia and Asperger's syndrome, mainly in cases of diagnostic doubt (cf. Konstantareas and Hewitt 2001:19, Remschmidt 2008:55).

The clinical picture of schizophrenia includes symptoms such as

"[...] distortions of thinking and perception, thought disorders, thought echo, delusional perception, hallucinatory voices [...]."

(ICD-10 2007, <http://apps.who.int/classifications/apps/icd/icd10online/>).

In addition, individuals who suffer from schizophrenia present neither early language development, nor extraordinary expressive language, nor motor clumsiness (cf. Remschmidt 2008:55).

Also, it has been noticed that individuals with high-functioning autism and milder forms of autism are more likely to meet the criteria of schizophrenia, but not vice versa (cf. Konstantareas and Hewitt 2001:19).

7.5. Prevalence

In contrast to infantile autism, fewer epidemiological studies of Asperger's syndrome have been published. In 1989, Gillberg and Gillberg suggested a prevalence rate of 1 to 3 per 1000 in Swedish school-aged children. In particular, the male phenotype seemed to be more prevalent than the female (3:1 to 15:1) (Gillberg and Gillberg 1989:631-633). Current research still attempts to figure out the exact distribution of male to female phenotype.

In 1993, Ehlers and Gillberg conducted the first population study in Göteborg, Sweden and reported a prevalence rate of 7.1 per 1000 children between the age of 7 and 16. According to them, individuals with Asperger's syndrome definitely present a higher prevalence rate than people with infantile autism (Ehlers and Gillberg 1993; cited by Remschmidt 2008:50).

It has to be mentioned though that this may be ascribed to the fact that higher-functioning people are included in the clinical picture as well as 'typical' individuals with Asperger's syndrome.

Current investigations report a rate of 1 per 166 in school-aged children. In addition, the paediatrician Gillian Baird (2006) suggested that about 1 percent of the population suffers from an autism spectrum condition (cf. cited by Baron-Cohen 2008:23).

Prevalence in autism has increased greatly within two decades. In fact, this increase implies not only better classification of the autistic spectrum, but also better recognition and training. Consequently, clinicians included milder cases and still attempt to conduct assessment not just in metropolis, but also in small towns (cf. Baron-Cohen 2008:25).

7.6. Aetiology

Indeed, numerous investigations have suggested a significant genetic background. Almost 50% of individuals with Asperger's syndrome are supposed to have close relatives with Asperger's syndrome or similar conditions. (cf. Gillberg and Coleman 1992:45).

On the same topic, Wolff (1995) investigated a group of 32 males and 33 females with Asperger's syndrome and schizophrenia. In total, she found 13 mothers and 11 fathers of affected cases having schizoid traits. In addition, DeLong and Nohria (1994) noticed that people with Asperger's syndrome, specifically high-functioning individuals had at least one close relative who suffered from bipolar or affective disorders. According to the authors, high-functioning autism may be a 'precursor' condition, followed by an affective or schizoid impairment (Wolff 1995, de Long and Nohria 1994; cited by Remschmidt 2008:57, 58).

However, the question remains as to whether Asperger's syndrome should be ascribed to inheritancal rather than to environmental factors such as brain damage etc. Quite a number of clinicial studies reported prenatal intricacies as well as dysfunction in the frontal brain area. As with individuals with infantile autism, people with Asperger's syndrome are supposed to suffer from deficits in neural processing (cf. Remschmidt 2008:59).

As regards neuropsychological deficits, Gillberg (1998) suggested four skills that are impaired in Asperger's syndrome and high-functioning autism: "*Mentalizing, central coherence, executive functions and word-mapping.*" (Gillberg 1998; cited by Remschmidt 2008:61). As these deficits do not appear similarly in affected individuals, differential diagnosis may progress.

As regards outcome in Asperger's syndrome, affected individuals range from excellent to poor. Unfortunately, a multitude of people with Asperger's syndrome never get in touch with clinicians as they do not show 'typical' impairments. Actually, the syndrome's course seems to proceed quite solidely. Affected individuals present the same range of characteristic features relatively unchanged throughout life (cf. Gillberg and Coleman 1992:49, 50).

8. Narrative competence in children with autism and Asperger's syndrome

8.1. Introduction

The ability to narrate a story enables us to share personal and life experience with our social environment. In fact, storytelling requires various skills that some people accomplish more successfully than others. First of all, one needs linguistic knowledge, which basically consists of the lexical meaning of words. Furthermore, syntactic knowledge is required to judge whether a sentence is grammatically correct and to describe events and episodes coherently.

According to Bamberg (1987:3), both linguistic and syntactic knowledge demonstrate the most important features in order to perform well in narrating. Nonetheless, one has to distinguish between these 'competences' and the skill of storytelling per se. Since the lexicon and syntax of a particular language can be perceived as specific knowledge areas, narrating is considered as an ability that results from this knowledge.

As regards the study of narrative competence, much focus has been out not just on typically developing children, but also on atypical language development. This chapter shall focus mainly on narrative development and the acquisition of narrative skills in atypical language development. In particular, the behaviour of children with autism and Asperger's syndrome shall be described in more detail.

8.2. The development of narrative structures

The study of narrative development has progressed thanks to the work of Labov and his colleagues, who investigated linguistic structures in the speech community. In fact, two major narrative functions can be ascribed to Labov, namely "reference" and "evaluation". Whilst reference serves the purpose to inform the listener to who are the main characters, and about the temporal and local aspects, the evaluative function should encourage the narrator to speak about personal experience.

In particular, the listener needs, first of all, to be acquainted with the main characters of the story. Then, the narrator has to emphasise where and when the event takes place. Consequently, one will be confronted with a series of sequences, which require a certain temporal order (“narrative clauses” vs. “free clauses”). According to the authors, the temporal sequence can be divided into four parts: “orientation”, “complication”, “resolution” and “coda” (Labov and Waletzky 1967:28 ff., Labov 1972:364).

Nonetheless, analysis by Labov and Waletzky was criticised in the early 1980s by the scientific community as categorising evaluative comments and elements seemed quite problematic. Furthermore, it has been argued that evaluative analyses would focus solely on personal situations, leaving out the interactive character of the narration per se (cf. Bamberg 1987:6).

It has to be mentioned though that the distinction between a referential and an evaluative function may actually be very helpful when analysing narratives created by children. Even if a child does not perform very well in organising a narrative temporally and portraying the plot, this does not necessarily imply an inability on the part of the child to reflect upon it. Within every narration the main character will be introduced first (“setting component”), followed by various sequences that illustrate the storyline (“episodes”).

The five different sequences that are supposed to form an episode consist of:

- *The initiating event: often stated in the form of a “problem” that requires a response from the protagonist(s).*
- *An internal response: i.e. an emotional or cognitive response, which usually contains a statement of goal.*
- *An attempt: i.e. the action of the protagonist according to his/her plan.*
- *A consequence of the attempt in the form of some outcome or result of the action effectuated by the protagonist.*
- *A reaction in the form of an emotional or cognitive response to the consequence.*

(Stein and Glenn 1979; cited by Bamberg 1987:7)

In 1977, Kernan investigated narrative development within a group of typically developing children and noticed an increase with age. With regard to reference, younger children tended to introduce the main characters by taking the perspective of the narrator. Furthermore, Kernan found out that older children were more likely to give background information than younger ones. Umiker-Sebeok (1978) analysed spontaneous narratives of children (age 3 to 5) and concluded that three-year old children produced stories that were on average one or two

clauses in length. As did Kernan, Umiker-Sebeok noticed an increase with age (cf. Bamberg 1987:8 ff).

Peterson and McCabe (1983) described narrative development in children as follows:

“With age, children develop the classic (adult) pattern of narration at least among their longest narratives, so that by 6 years it is the most prevalent form. Prior to this, the youngest children jump from one event to another in telling about what must have been an integrated experience. At age 5, they end their narratives at the high point. But after that, children build to a high point and resolve it in classic form”

(Peterson and McCabe 1983:61)

In fact, typically developing children acquire interactive and communicative abilities very early on (see Chapter 6). It should be stressed that these skills may contribute an important part to the development of narrative structures as the young child will be confronted with narrative behaviour within peer-conversation. Even in the earliest period of conversation, children make use of certain narrative strategies in order to communicate successfully (cf. Bamberg 1987:12).

As regards narrative development in autism, as of yet little research has been conducted. Few studies that focus on the ability of affected individuals to organise and evaluate narratives have been published. In addition to this somewhat limited research, the extent to which cognitive impairments (e.g. Theory of Mind, central coherence etc.) may be related to atypical storytelling has also been investigated. Almost all of these studies used wordless picture books as an investigation method in order to explore the discourse of the children. As far as cognitive profile in autism is concerned, various impairments (e.g. controlling emotions, planning actions, establishing a global coherent picture etc.) became evident. In particular, individuals with Asperger’s syndrome showed difficulties in tasks of central coherence.

8.3. Text competence

According to Portmann-Teslikas (2005:2), we have to distinguish between the terms text competence and linguistic competence. Indeed, the ability to produce and comprehend a text implies knowledge of language. Moreover, a text can be perceived as the combination of lexical and grammatical relationships. However, difficulties appear when it comes to determining an adequate definition of the term ‘text’.

In 1976, Halliday and Hasan suggested that *“The word text is used in linguistics to refer to any passage, spoken or written, of whatever length, that does form a unified whole.”* (Halliday and Hasan 1976:1)

According to de Beaugrande and Dressler (1988:3-4), a text can be perceived as an autonomous entity, which follows certain linguistic criteria.

In 1987, the authors postulated seven standards of textuality as follows:

“Cohesion, Coherence, Intentionality, Acceptability, Informativity, Situationality, Intertextuality”

(de Beaugrande and Dressler 1988:3 ff)

In this section, coherence and cohesion shall be of particular interest since these criteria play an important part in the development of narratives. Thus, storytelling requires the ability to link words and phrases (grammatically and semantically correct) in order to produce a coherent narration.

8.3.1. Cohesion

According to de Beaugrande and Dressler (1988:48), cohesion can be defined as the grammatical relationship within a text or sentence that combines various components on the “surface”; hence, words and phrases that we can actually see and hear. These elements depend upon each other and follow certain grammatical conventions.

In contrast, Halliday and Hasan suggested that *“Cohesive relations are relations that are independent of the structure [...]”* (Halliday and Hasan 1976:7). According to them, the term text does not imply a grammatical dependence and can not be seen as a structured entity. Rather, they view a text as a semantic construct.

Indeed, coherent storytelling does not require linguistic knowledge alone, but also a story component per se. When discussing the term cohesion, two concepts need to be emphasised, namely “reference” and “co-reference”.

According to Lyons (1977), the term “reference” describes the relationship between a linguistic expression and a referent; hence the object or person the expression refers to (cf. Lyons 1977:174).

The following examples will try to illustrate the concept of reference:

(1) John talked to John.

It goes without saying that these two objects do not represent the same person, although both of them are named John. Thus, specific ‘rules’ must exist that enable these two referents to be distinguished.

(2) John talked to himself.

In this example, the constituents ‘John’ and ‘himself’ share the same reference (“co-reference”). It has to be mentioned, though, that languages differ in their concepts of reference. For example, English-speaking individuals may not command such a clear distinction as German-speaking people do.

In 1987, Bamberg distinguished three major strategies:

- “Character as anchor-point”: Most of the clauses describe the mental states and emotions of the protagonists. Through the use of lexical forms children firstly refer to different characters and attempt to gauge their identity.
- “Temporal anchor-point”: At the very beginning of the narrative a time line evolves, followed by various temporal episodes.
- “Location as anchor-point”: The location of the narrative is introduced at the beginning.

(cf. Bamberg 1987:19 ff)

8.3.2. Coherence

Coherence makes a text semantically and pragmatically meaningful and combines concepts and relations that are located on the text surface to each other. It has to be mentioned though that these relations may not always be perceived explicitly. Thus, one has to activate world knowledge in order to extrapolate the actual meaning (cf. de Beaugrande and Dressler 1988: 84).

According to Bamberg (1987:14-15), one can achieve a coherent interpretation by applying two major strategies:

- “Top-down processing”: includes experience, knowledge and intentions. Individuals perceive incoming data, filter them, form new predictions and expectations and interpret them.
- “Bottom-up processing”: enables an individual to determine clues beyond the surface and how signals are to be understood.

Thus far, both coherence and cohesion play an important part in the development of narrative strategies. As seen above, a coherent text interpretation does not only require linguistic skills, but also access to empirical knowledge and predictions. As the interpreter is supposed to activate cognitive functions, individuals with atypical development may have difficulties with the concepts of coherence and cohesion.

In all, typically developing children seem to have acquired certain cohesive devices by the age of two and three (e.g. the pronominal system) and tend to use forms that are specific to adult-narratives. By the age of three, children seem to have a basic understanding of a coherent narrative schema, but they are not actually able to use it (Bamberg 1987:17).

8.3.3 Intentionality and Acceptability

According to de Beaugrande and Dressler (1988:113), a competent speaker can also produce texts which do not seem fully cohesive and coherent. Therefore, it is important to include the attitude of a speaker. Thus, the configuration of a linguistic expression must be intended and accepted by the listener in order to communicate successfully.

8.3.4 Informativity

This criterion describes the extent to which the listener is confronted with new and unexpected information. Indeed, the processing of new information seems to be harder than the mapping of already existing information (cf. de Beaugrande and Dressler 1988:139-141).

8.3.5 Situationality

De Beaugrande and Dressler (1988:164) emphasise that the participants of a conversation make an effort to guide the situation in order to arrive at the text producer's goal.

8.3.6 Intertextuality

The last criterion describes the manner in which the production of a new text depends upon the speaker's knowledge of other texts. Consequently, the behaviour of the participants changes when they are confronted with a new text (De Beaugrande and Dressler 1988:245).

8.4. Picture book narration

As mentioned previously, a number of investigations have used wordless picture books in order to establish narrative development not solely in typically developing, but also in impaired individuals.

Before carrying out an investigation, an appropriate data base that includes the following criteria is required:

- (a) *The data need to be “comparable” over large spans of cognitive and communicative development, since the processes we are dealing with are not short-term acquisitional processes.*
- (b) *The data have to be “ecologically valid” with regard to the cultural and cognitive abilities of the children.*
- (c) *The data should be “informative” and “clear” with respect to the referential and communicative context in which the utterances are voiced.*
- (d) *The data need to be “rich” enough to allow for an analysis at different unit levels (the within-sentence level of analysis, as well as spans of connected discourse).*

(Bamberg 1987:20)

Numerous authors support the use of picture books as a valid investigation method since they come close to imitating early mother-child interaction. For example, the young child starts by specifying and labelling elements and gradually develops discursive skills. Some authors have also suggested that these developmental periods could prepare the child for classroom interactions (cf. Bamberg 1987:21).

8.4.1. “Frog, where are you?”

Michael Bamberg investigated “*children’s creation of a system of linguistic devices for text cohesive functions*” in a group of typically developing children and published his findings in 1987 (Bamberg 1987:19).

In total, twenty-five typically developing children (3;6 to 10;1 years) participated in the study by Bamberg. All of them were resident in Berlin, grew up with German as their native language and represented more or less the working- and middle-classes. The material being used for investigation was the picture book “Frog, where are you?” by Mercer Mayer (1969), that consists of 24 pictures with no written text (Bamberg 1987:21 ff).

In brief, the Frog-story is about a boy, a dog and their pet frog, which runs away while the boy and his dog are asleep. The next morning, both the boy and the dog notice that the frog is gone and begin to search for it. During their journey, they experience a few adventures and

come across other animals that live in the forest. In the end, they find their frog and head happily homewards.

The book by Mayer seems to be well-suited to investigate narrative production as the test subject is confronted with a central theme (=the frog ran away), which includes various activities on the part of the main characters (=the boy and the dog look for their frog). Several sequences are present, which make the plot more complicated. In addition, the storyline unfolds in a tricky way. In comparison to the frog, the boy and the dog are guided by a mutual aim (=they want to find the frog) and come across several obstacles. Since the narrator has to be aware of two parallel sequences that include switching temporally between the protagonists, difficulties may appear (cf. Bamberg 1987:21-22).

As already mentioned, individuals with autism frequently struggle with aspects of time and space as they rarely make use of temporal markers (e.g. past tense suffixes etc.). Thus, affected individuals might not use different tenses whilst describing the actions of the protagonists. Seemingly, both the boy and the dog are perceived by the test subjects as real individuals that are supposed to show emotions and mental ‘activity’.

Within this investigation, a researcher presented the picture book of a different “Frog-story” to a group of children by showing the pictures in the form of a slide show. By narrating the main plot, he aimed to prepare the children for the following tasks. The next day, the children were encouraged to recount Mayer’s “Frog, where are you?” to the researcher in the following way: in the first place, each child was individually asked to look through the picture book and then requested to narrate the story. The researcher did not actively interact with the child, although he was signalling attention by following the narration as a passive listener (Bamberg 1987:23-24).

8.5. Narrative competence in individuals with autism and Asperger’s syndrome

8.5.1. Introduction

The following analysis shall focus on narrative ability in children with autism and Asperger’s syndrome. The question of whether affected individuals are able to apply linguistic and cognitive knowledge to their narratives will be discussed. Unfortunately, as of yet no findings that mainly concentrate on the aspects of reference and co-reference have been published.

Indeed, the ability to produce a structured and coherent narration includes not only linguistic knowledge, but also cognitive ‘functioning’ in order to comprehend the intentions of the

protagonists. Whilst typically developing children increase their cognitive skills with age, autistic individuals seem to be ‘stuck’. Moreover, individuals with Asperger’s syndrome are supposed to show no significant delay in language development and their cognitive skills are thought to be typical. Nonetheless, group differences become evident in comparison to typically developing children.

Therefore, the following questions may be of considerable interest:

- *Do individuals with autism and Asperger’s syndrome differ significantly from typically developing children with respect to their narrative competence?*
- *Are affected individuals able to relate actions and sequences appropriately in order to produce a coherent global narration?*
- *Do impaired children differ significantly in their linguistic and cognitive knowledge?*

In the course of this analysis, two case studies about the narrative competence in children with autism and Asperger’s syndrome shall be discussed in more detail. By using Mercer Mayer’s (1969) wordless picture book “Frog on his own” and “Frog, where are you?”, the authors Capps, Losh and Thurber (2000, 2003) compared a group of typically developing children to individuals with autism and Asperger’s syndrome.

8.5.2. What has been done so far?

Recent research has focused on narrative development (including linguistic, cognitive and social skills) in impaired individuals. Since people with autism show impairments in socio-communicative and pragmatic abilities, they represent quite a promising target group for investigation. In addition, examination of narratives may support diagnosis and could even help to improve the social and pragmatic skills of affected individuals.

Loveland et al. (1990; cited by Capps, Losh and Thurber 2000:193) and colleagues compared a group of autistic individuals to a group of children with Down’s syndrome and asked test subjects to re-narrate a puppet show. Upon investigation, children with autism performed more poorly in storytelling as they made more grammatical errors, did not refer to central themes etc. Furthermore, they were not responsive to the mental states of the protagonists.

As regards the judgement of mental states, Tager-Flusberg (1995:50 ff.) noticed no significant difference between young children with autism and typically developing children, but it

became obvious that individuals with autism structured their narratives in a less grammatically complex manner. Differences became evident with respect to linguistic structure and story length. Thus, autistic children tended to narrate shorter stories and were less likely to use causal language.

In fact, mastering narratives contributes a major part to our social understanding, communicative competence and interaction with other individuals. As a consequence, deficits in narrative skills can definitely affect these competencies. Therefore, future investigations with autistic individuals have become more important as significant findings may influence intervention and therapy.

8.5.3. "The frog ate the bug and made his mouth sad": Narrative competence in children with autism

8.5.3.1 Method

In 2000, Capps, Losh and Thurber investigated narrative abilities in autism. Within their study, the authors compared 13 individuals with autism to 13 children with developmental delay and a group of typically developing children. By using the wordless picture book "Frog on His Own" (Mayer 1973), narratives were elicited and test samples were consulted from a longitudinal study. Since the test subjects were replaced over a period of many years, diagnostic criteria changed. Children who suffered from autism and developmental delay were diagnosed by using the "Diagnostic and Statistical Manual of Mental Disorders" (APA, 1987).

In addition, video-tapes (*Childhood Autism Rating Scale*) and parent reports (*Autism Behavior Checklist*) were included in diagnosis. It has to be mentioned though that only children who actually met diagnostic criteria for autism were included. As regards language ability, all subjects were diagnosed by using the *Clinical Evaluation of Language Fundamentals* (CELF). Each child had to look through the pages once and was then asked to narrate the story to the experimenter.

The stories were audio- and videotaped and transcribed using the *Child Language Data Exchange System* (CHILDES). According to the authors, the picture book authored by Mayer was chosen as it contains several parts that challenge the child to describe the mental states and behaviours of the protagonists (cf. Capps, Losh and Thurber 2000:195 ff.).

8.5.3.2 Linguistic skills

In order to quantify story length, propositions were tallied. Grammatical skills were examined by identifying morphological and syntactic abilities and making an analysis of morphological errors (type and frequency). The following types of errors were recorded and coded: omission (auxiliary, determiner) and commission (over-regularization, agreement, pronouns). However, syntactic analysis included an assessment of coordinate clauses, verb complements, subordinate adverbial clauses, relative clauses and passive constructions.

As mentioned previously, each narrator makes use of evaluative devices in order to build up tension and set out the main theme of the story. These devices enable the narrator to arouse interest in the audience and include the listener in the event. However, the authors investigated evaluative elements based on the following scheme of types:

- *Causality*: the narrator attempts to figure out the cause and motivation for several events (e.g. “the boat sank *because the frog jumped on it*”)
- *Emotion and Cognition*: includes description of the affective states and behaviours of the protagonists (e.g. “the boy was *sad*”).
- *Negatives*: “the frog didn’t know he swallowed a wasp”. This proposition implies a sudden turn in regard to the behaviour of the protagonist.
- *Hedges*: indicate uncertainty
- *Character Speech*
- *Onomatopoeia and Sound Effects*: By using character speech, the narrator attempts to capture the attention of the listener (e.g. “an’ the boy said ‘*get away from my frog!*’”).
- *Intensifiers and Attention-Getters*: similar to the previous category.

(Reilly, Klima and Bellugi 1991; cited by Capps, Losh and Thurber 2000:197)

In addition, children with autism and developmental delays participated in the following false belief tasks of Theory of Mind. Each child was asked to distinguish between their own beliefs about the location of an object and those of a person who has not seen a change of this object. Actually, no significant differences were noticed between the autistic group and developmentally delayed children.

Finally, these test subjects had to take part in an informal conversation, conducted by an examiner who was familiar with the groups. The children had to respond to questions about

friends, school and vacations. Each conversation was audio- and videotaped and took about six minutes. In fact, the aim of the examiner was to encourage the children not only to speak about relevant topics, but to add novel information too. In comparison, autistic children were less likely to fulfill this requirement (cf. Capps, Losh and Thurber 2000:197 ff.).

8.5.3.3 Findings

As regards story length, significant differences became evident. In contrast to the comparison group, children with autism and developmental delay tended to tell shorter stories. Whilst young autistics and developmentally delayed children produced on average 44.37 propositions, the comparison group produced 58 propositions. In addition, all three groups differed in the frequency of grammatical errors and syntactic devices.

Surprisingly, there was no significant difference between test subjects with respect to the type of morphological errors made. Whilst children with autism and developmental delay committed morphological errors twice as much as typically developing children the errors they committed were of similar types (e.g. agreement, omission). However, significant differences showed up in complex syntax. Impaired individuals were less likely to use syntactic forms correctly than typically developing children.

This result correlates with the previous assumption (see Chapter 6) that children with autism do not perform well in syntactic tasks. On the one hand, it seems that they are not delayed in their syntactic development, but on the other hand, they show deficits in sentence comprehension. Nonetheless, it has not been proven that autistic individuals differ significantly in their syntactic development from typically developing children. As previously discussed, affected individuals may suffer from deficits in processing general information.

As regards evaluative devices, significant differences were detected within the autistic and the developmentally delayed group. Impaired individuals did not differ in the frequency of causal attributions and reference to the mental states of protagonists. Thus whilst, typically developing children did not just describe the characters' mental state, but added a causal framework:

- (1) *"She's cryin' because she loved her friend frog an' the mother said, 'don't play with your friend frog!'"*

(Capps, Losh and Thurber 2000:199)

In contrast, autistic individuals tended to describe the emotional state of the child without any causal framework:

(2) *“An’ the baby was crying. The frog was trying to get away.”*

(Capps, Losh and Thurber 2000:199)

It is obvious then, that both groups aimed to describe the mental states of the characters, but only typically developing children related emotions to an action. Surprisingly, children with autism and developmental delay were more likely to include information about the actions and behaviours of the characters than typically developing children:

(3) *“They took out their stuff so they can eat.”*

(4) *“The other one was reaching into the picnic basket to get something.”*

(Capps, Losh and Thurber 2000:200)

Autistic children were less likely to focus on a particular event and integrate character speech and sounds. Thus it could be that autistic individuals may not feel the need to arouse the attention of the listener.

8.5.3.4 Conclusion

Although children with autism and developmental delay exhibit some deficits in complex syntax and empathy, their narrative performance is definitely comparable to typically developing children. As regards the performance of developmentally delayed children, no differences were detected when compared to the autistic group. Differences became evident in performance of Theory of Mind.

With respect to narrative performance, children with autism showed deficits in the use of complex syntax (e.g. temporal and causal marks). As discussed previously, children begin to relate events linearly by the age of three; moreover, by the age of five they are already attempting to integrate a temporal component in order to give background information. In fact, complex syntax enables narrators to connect episodes to each other and explore more global and coherent themes. Based upon this statement, children with autism ought to focus solely on single episodes instead of giving more detailed descriptions.

According to the authors,

“the relative lack of complex syntax and limited explanation of character’s internal states among children with autism and children with developmental delays suggests limited appreciation of and access to the social problem-solving functions of narratives”

(Capps, Losh and Thurber 2000:201).

It has to be mentioned though, that children with autism and developmental delay were indeed able to reflect upon the internal states of the characters, but failed to situate them within a causal framework. This does not necessarily imply a deficit in the ability to figure out the central theme of the story. Therefore, it may be quite overstated to speak of *“limited access”*.

Furthermore, these findings suggest limited use of evaluative devices. The authors suggest that a poor performance in narration may be due to a general deficit in language development. Therefore, it may be of essential interest to establish narrative skills in autistic individuals whose language abilities are superior to those subjects who participated in this study (cf. Capps, Losh and Thurber 2000:201-202).

8.5.4. “Narrative ability in high-functioning children with autism or Asperger’s syndrome”

8.5.4.1 Introduction

In contrast to the former study, the following investigation focuses on narrative abilities in high-functioning individuals and children with Asperger’s syndrome. Just as in the first study, the wordless picture book, “Frog, where are you?” (Mayer 1969) was used to elicit narrations (cf. Losh and Capps 2003:239).

In comparison to children with autism, high-functioning people and individuals with Asperger’s syndrome ought, in theory, to perform better in narrative tasks since they do not suffer from any significant delay in language development. Nonetheless, social and communicative deficits are evident and may become obvious in measures of emotional understanding and evaluation. As regards morphological and syntactic skills, one may assume that individuals with Asperger’s syndrome are more likely to use grammatically correct forms and structures than children with autism. Furthermore, it is of essential interest to investigate the use of causal relations and evaluative devices in more detail.

8.5.4.2 Method

In this investigation, 28 individuals with autism or Asperger's syndrome and 22 typically developing children were tested. Impaired individuals were consulted through several clinicians and each child had been diagnosed as suffering from autism or Asperger's syndrome based on the DSM-III-R (APA 1987) and the ICD-10 (WHO 1993).

Whilst 8 children clearly met diagnostic criteria for autism, 20 individuals exhibited social impairments and repetitive behaviour, but did not show any significant delay in language or cognitive development. Therefore, these children were diagnosed as showing more criteria for Asperger's syndrome. However, typically developing children were consulted from schools and were matched on chronological age and verbal IQ.

Initially, the children were asked to tell the researcher stories about their daily habits and things they like to do in their free time. The actual aim was to prompt the children for more detailed and particular narrations. Then, narratives were elicited using Mayer's wordless picture book. Each session was audio- and videotaped, and narratives were coded and structured. As with the former study, this investigation assessed grammatical structures and evaluative devices. In order to measure story length, the total number of clauses was included. As regards grammatical structures, frequency and range of complex syntax were assessed. The following types of phrases were analysed: coordinate clauses, verb complements, adverbial clauses and passive constructions.

Narratives were analysed by separating them into two different tasks: *Personal Narratives* and *Storybook Narratives*. With respect to personal narratives, children were asked to tell stories about their usual habits. Thus, they had the possibility to talk about their own interests and themes. As regards storybook narratives, the authors investigated the ability of the children to refer to the basic themes of the story, including the protagonists, the basic settings and the resolution. Children were also asked to explore the main plot of the story.

Before assessing narrative ability, each child had to complete several tasks of Theory of Mind and emotional understanding. In addition, children were asked to define emotions and label certain forms of behaviour (cf. Capps and Losh 2003:241 ff.).

8.5.4.3 Findings

No significant differences were detected between the high-functioning group and individuals with Asperger's syndrome. Children with autism and Asperger's syndrome were counted as a single group and compared to typically developing children. In comparison to storybook narratives, both groups tended to tell longer personal narratives. Obviously, children were more likely to talk about their own interests and experiences rather than following a certain schema. At this point, one could assume that autistic individuals ought to perform more poorly on this part as perhaps they might not be able to structure their narratives and make sense of the behaviour of the protagonists. However, no significant group differences were detected. Nonetheless, subjects with autism and Asperger's syndrome were less likely to include complex syntax within their personal narratives whereas typically developing children used nearly twice as much. Surprisingly, the groups did not differ in regards to the storybook narratives.

As far as evaluative devices are concerned, typically developing children performed significantly better in the personal context as they used more evaluation. It may be of essential interest to note that individuals with Asperger's syndrome used almost the same amount of evaluative devices in the storybook context, but performed worse when producing personal narratives.

As regards measurements of Theory of Mind and emotional understanding, children with autism and Asperger's syndrome offered less adequate definitions of emotions and social understanding in both personal and narrative context (cf. Capps and Losh 2003:244 ff).

8.5.4.4 Conclusion

Although both groups differed in the storybook context, they performed fairly comparably in the personal context (e.g. story length). According to the authors, children with autism described fewer sequences and presented problems in understanding the main plot of the story (cf. Capps and Losh 2003:248).

By assessing narrative abilities not in autistic children alone, but also in individuals with Asperger's syndrome, it became evident that significant differences can be detected. Whilst the autistic group had more difficulty with the use of complex syntax and evaluative devices, children with Asperger's syndrome performed similarly to the control group. In particular, personal narratives did not cause them such severe difficulties.

This being the case, one may assume that it depends on the sort of narrative used. Thus, there must be a difference (e.g. structure, thematic focus) between personal and storybook context. Children with Asperger's syndrome performed quite well when they were asked to produce narratives of personal experience. Although affected individuals did not elaborate their narratives that extensively, they were able to describe their daily activities and habits appropriately.

As previously mentioned, structural differences between personal and storybook narratives may influence findings. À propos to this, the fact that social and cognitive abilities may be an important matter comes to mind; specific cognitive skills (e.g. Theory of Mind, central coherence) may be required in order to master these tasks.

8.5.4.5 Discussion

This last section shall address the main questions of the chapter:

Do individuals with autism and Asperger's syndrome differ significantly from typically developing children with respect to their narrative competence?

It has been suggested (Capps, Losh and Thurber 2000, Capps and Losh 2003) that autistic children have more difficulties in comparison to children with Asperger's syndrome and typically developing children. Both investigations approved this assumption.

As regards autistic individuals, deficits in the use of complex syntax, evaluative devices and description of episodes were detected. One area of difficulty was the limited use of causal language in order to relate events to each other. In contrast, children with Asperger's syndrome did not seem to have such severe difficulties. Although affected children did not frequently use evaluative devices and complex syntax, they were able to comprehend the main theme of the story and the behaviour of the protagonists. Moreover, children with Asperger's syndrome performed better in terms of Theory of Mind and emotional understanding tasks.

The most surprising finding was perhaps the performance of individuals with Asperger's syndrome within narratives of personal context. High-functioning children performed comparably to the control group on measures of narrative ability. For instance, groups told stories of similar length. As successful narration includes not only linguistic competencies,

but also cognitive abilities, children with Asperger's syndrome might not show the same deficits as low-functioning individuals (cf. Losh and Capps 2003).

Nevertheless, it is not clear that the results from the work of Losh and Capps definitely characterise the narrative skills of affected children. An important goal for the future is to investigate why children with autism and Asperger's syndrome perform differently in personal and storybook contexts and which structures pose the greatest challenges to them.

Are affected individuals able to relate actions and sequences appropriately in order to produce a coherent global narration?

With respect to the ability of children to create a coherent narration, the investigations carried out by Losh and Capps provided little information. Unfortunately, descriptions of sequences and episodes have not been discussed in more detail. Therefore, assumptions about the performance amongst children cannot be made easily.

The following figure shows the distribution and frequency of causal statements amongst the test subjects:

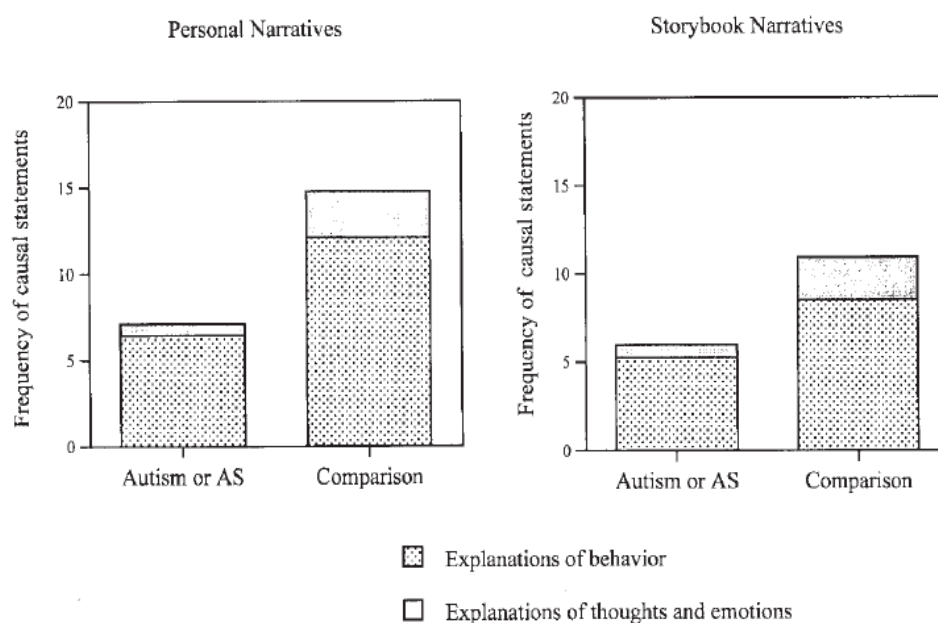


Figure II: Types of causal explanations.

(Losh and Capps 2003:246).

In general, causal statements answer the purpose of evaluating behaviour and emotions. Thus, test subjects used causal devices in order to judge the socio-emotive behaviour of protagonists. Even if these statements aim to describe emotions in the first place, they may also be useful when relating events and episodes to each other. In fact, description of the behaviour of the characters implies the ability to see things from the perspective of another person (Theory of Mind). Nonetheless, the child has to be able to recognise and explain the actions of the protagonists in order to relate events and produce a coherent narration.

With respect to the figure above, it becomes apparent that children with autism and Asperger's syndrome seem to use less causal devices than typically developing children. As evidenced by their performing worse in describing the behaviour of characters and relating actions to each other. As regards children with autism, it has already been mentioned that they showed deficits in Theory of Mind tasks and used less causal devices. Children with Asperger's syndrome also exhibited problems in socio-emotive understanding, but performed similarly to the control group. Nonetheless, children with autism or Asperger's syndrome were as likely as the control children to relate events and experiences within the personal context. Thus, no significant differences were detected.

With regard to the aspect of reference, it seems that children with autism and Asperger's syndrome were less likely to establish this concept within their narrations. Whilst typically developing children were already capable of introducing a story character by the use of pronouns (*"She's cryin' because she loved her friend frog an' the mother said, don't play with your friend frog!"*), this was not the case for impaired individuals (*"An' the baby was crying. The frog was trying to get away."*) (Capps, Losh and Thurber 2000:199).

Unfortunately, there have not been enough linguistic data available to analyse this aspect appropriately. Nonetheless, it became evident that not only autistic children, but also individuals with Asperger's syndrome showed deficits in the use of complex syntax. As mentioned in Chapter 6, affected individuals exhibit abnormalities in the use of deictic markers such as pronouns. It was also noted that the ability to establish reference and moreover, produce a coherent narration requires intact pragmatic skills. As these proficiencies are impaired in autistic individuals, one may argue that deficits in the use of deictic markers can be ascribed to this impairment. Nonetheless, the comparison of these two studies discovered that individuals with Asperger's syndrome seem to be comparable to typically developing children with respect to certain areas. Therefore, it would be of particular interest

to investigate the aspects of reference and coherence in a bigger sample of children with Asperger's syndrome.

Looking ahead, more research concerning the aspect of reference in narratives is definitely needed.

Do impaired children differ significantly in their linguistic and cognitive knowledge?

With respect to linguistic skills, children with autism or Asperger's syndrome are less likely to use complex syntax. Losh and Capps (2003:248) noted that control children used much more complex syntax in their personal context than in their storybook narratives. In contrast, no differences were detected for autistic individuals. As regards morphological ability, autistic children committed twice as many errors than typically developing children did, but both groups produced similar types of errors.

With regard to evaluative devices, groups did not differ in the frequency of types of evaluation, but individuals with autism failed to present additional information. Typically developing children did not only describe the cognitive state of the protagonists, but also added information within a causal framework. In contrast, children with autism did not integrate any causal elements into their description (cf. Losh, Capps and Thurber 2000:199).

Performance on Theory of Mind and emotional understanding tasks was significantly impaired in children with autism or Asperger's syndrome. Affected children failed to describe the cognitive and emotional states of the characters and were further not able to identify certain emotions (cf. Losh and Capps 2003:247).

The following figure shall illustrate the performance of the children:

Group	Theory of mind*		Emotion definitions*		Emotion labels for video vignettes*	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Autism or Asperger's Syndrome	15.8	4.3	19.7	3.7	16.1	1.9
Range	8–24		10–24		10–18	
Comparison	19.2	2.8	22.6	2.8	17.8	1.4
Range	13–24		15–24		15–20	

Table I: Theory of Mind and Emotional Understanding Performance (Losh and Capps 2003:247).

It is clear that children with autism or Asperger's syndrome performed worse than typically developing children. Nonetheless, individuals with Asperger's syndrome were more likely to describe cognitive states than autistic children. In fact, this may suggest the assumption that individuals with Asperger's syndrome perform similarly to typically developing children.

However, from investigation it became apparent that children with autism follow a homogenous error pattern. In contrast, individuals with Asperger's syndrome still cause excitement as they frequently present varying results. On the one hand they seem to be able to keep up with typically developing children, but on the other hand findings frequently fall into the range of autistic individuals. However, future investigations should not focus solely on autistic individuals and comparing them to children with Asperger's syndrome, but on investigating the abilities per se of affected individuals.

This thesis was also concerned with highlighting the fact that autism lies on a spectrum. As already mentioned, diagnosis of autism spectrum disorders is difficult as affected individuals differ not only in the severity of symptoms, but also in their behaviour and outcome. Therefore, it is quite questionable to approve the results of the study of Losh and Capps (2003) as they combined a group of children with autism and Asperger's syndrome. Furthermore, they did not distinguish between the performances of affected children per se, they only compared them to a control group. Unfortunately, there have not been enough linguistic data and investigations available in order to accomplish an adequate analysis. Although a few studies concerning validation of Asperger's syndrome have been published,

research still adheres to the common features in autism and Asperger's syndrome instead of focusing on each condition alone.

Looking ahead, more research concerning not only narrative abilities, but also language development and linguistic skills in Asperger's syndrome is definitely needed. Indeed, this would not only support the scientific consensus, but also affected individuals per se as new diagnostic and therapy methods would evolve.

9. Appendix

9.1. Figures

Figure I: AQ scores in a group diagnosed with Autism Spectrum Conditions (ASC), and a typical control group.

Baron-Cohen S. 2008. Autism and Asperger's syndrome. Oxford University Press, p. 32.

Figure II: Types of causal explanations.

Losh, M. and Capps. L. 2003. Narrative ability in high-functioning children with autism or Asperger's syndrome. *Journal of Autism and Developmental Disorders* **33**(3), p.246.

Table I: Theory of Mind and Emotional Understanding.

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9.3. Curriculum Vitae

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12/2005 – 02/2008	Skiing Instructor for children (Mönichkirchen, Austria)
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9.4 Eidesstattliche Erklärung

Ich erkläre an Eides statt, dass ich diese Diplomarbeit selbständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe. Die Stellen meiner Arbeit, die dem Wortlaut oder dem Sinn nach anderen Werken übernommen sind, habe ich in jedem Fall unter Angabe der Quelle als Entlehnung kenntlich gemacht. Dasselbe gilt sinngemäß für Tabellen, Karten und Abbildungen. Diese Arbeit hat in dieser oder einer ähnlichen Form noch nicht im Rahmen einer anderen Prüfung vorgelegen.

Wien, im Mai 2011

Unterschrift